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EG-245

# Norfolk Southern Bailway System in South Carolina

Click to turn features on and off:

Back to System Map | This page is best viewed with your browser window maximized.



Sec. 2.1 Ref. 2 SCEFG 1978

OLER, Amendment 3,

Oct. 1978



south carolina electric & gas company

operating license environmental report

1

## 2.0 SITE CHARACTERISTICS

#### 2.1 GEOGRAPHY AND DEMOGRAPHY

2.1.1 SITE LOCATION AND DESCRIPTION

# 2.1.1.1 Specification of Location

The Virgil C. Summer Nuclear Station site is in Fairfield County, S.C., approximately 15 miles southwest of the county seat of Winnsboro and 26 miles northwest of Columbia, the state capital. The site is in a sparsely populated rural area. The nearest community is Jenkinsville, approximately 3 miles southeast of the site. The Broad River is located approximately 1 mile west of the site and flows in a southerly direction. Lake Murray, 12 miles south of the site, is a 50,000 acre reservoir utilized for hydroelectric power generation and recreation. A regional location map (Figure 2.1-1) and a site location map (Figure 2.1-2) indicate the plant location with respect to local and regional features.

The reactor building is located at latitude N34°17'54.1" and longitude W81°18'54.6". Universal Transverse Mercator (UTM) grid coordinates, Zone 17, for the reactor building are N3,795,086 and E470,996.

#### 2.1.1.2 Site Area

The plant features and site area map (Figure 2.1-3) indicates the site boundary, plant property line, and the location of principal plant structures in relation to existing features in the area. The exclusion area consists of a zone within approximately 1 mile of the reactor building. This area encompasses parts of Monticello Reservoir and the Fairfield Pumped Storage Facility. South Carolina Electric & Gas Company has acquired, by purchase, all land within the site boundary. For purposes related to the operation of the nuclear facilities, the

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The location of the Fairfield Pumped Storage Facility is shown on Figure 2.1-3. Personnel of this facility are limited to employees of SCE&G and therefore are subject to administrative controls of the company. The pumped storage facility is staffed by approximately 10 people during day shift and one operator for each night shift. The estimated time to evacuate all personnel from this facility is 10 minutes if the plant is not running and 20 minutes if the units must be shut down.

#### 2.1.2.2 Control of Activities Unrelated to Plant Operation

Recreational activities within the exclusion area are under the control of the applicant. Appropriate warning signs notify the public of the exclusion area. Floating markers will be placed along that portion of the Monticello Reservoir encompassed by the exclusion area and shall be maintained during the operating life of the plant.

The applicant maintains the right to limit access and to control evacuation from the exclusion area. Normal evacuation of persons within the exclusion area is estimated to take no more than 20 minutes.

## 2.1.3 POPULATION AND POPULATION DISTRIBUTION

The location of the site in relation to the surrounding cities and towns within a 50 mile radius is shown on Figure 2.1-1. Communities for which census population data are available are listed, together with their 1970 populations, in Table 2.1-1 (incorporated cities, towns, villages, and unincorporated places of 1,000 or more persons).

The base (1970) population distribution has been taken from the PSAR for the Virgil C. Summer Nuclear Station. Projections are based on available estimates produced in December 1975, by the Bureau of Economic Analysis (BEA) for the U. S. Army Corps of Engineers, South Atlantic Division (1).

2.1-4

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Fairfield 1997

# COMPREHENSIVE PLAN UPDATE, 1997

# FAIRFIELD COUNTY

Prepared By: Vismor & Associates, Inc.

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# RESOLUTION RECOMMENDING ADOPTION OF A COMPREHENSIVE PLAN FOR FAIRFIELD COUNTY, SOUTH CAROLINA

- WHEREAS, the General Assembly of South Carolina enacted in 1994 an amendment to the Code of Laws of South Carolina by adding Chapter 29 to Title 6, "South Carolina Local Government Comprehensive Planning Enabling Act of 1994", and repealing all previously enacted planning Acts and Codes; and
- WIIEREAS, the 1994 Enabling Act requires that the local planning commission develop and maintain a planning process which will result in the systematic preparation and continued reevaluation and updating of those elements considered critical, necessary, and desirable to guide the development and redevelopment of its area of jurisdiction; and
- WHEREAS, the planning process shall include the development of a Comprehensive Plan which shall consist of a population element, an economic element, natural and cultural resources element, a community facilities element, a housing element, and a land use element; and
- WHEREAS, the Fairfield County Planning Commission developed and adopted 11-19-92 such a Plan; and
- WHEREAS, the 1994 Planning Enabling Act stipulates that the "Planning Commission shall review the Comprehensive Plan or elements of it as often as necessary, but not less than once every five years; and
- WHEREAS, the Fairfield County Planning Commission on this five-year anniversary (1997) has reviewed the Plan to determine the need for change, and has recommended amending the Plan to incorporate such change(s) as included in such document and shown on the Plan Map:

NOW THEREFORE, THE FAIRFIELD COUNTY PLANNING COMMISSION, BY RESOLUTION, HEREBY RECOMMENDS FOR ADOPTION BY FAIRFIELD COUNTY COUNCIL A REVISED AND AMENDED "COMPREHENSIVE PLAN" FOR FAIRFIELD COUNTY, INCLUDING ALL REFERENCED PLAN MAPS, THIS 15 DAY OF APRIL, 1997.

Mike Mills, Chairman Fairfield County Planning Commission

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#### INTRODUCTION

Fairfield County was created in 1785, with the division of the Camden District into five counties. Prior to the establishment of the county, it was a hunting ground for the Catawba Indians, and was subsequently settled by the English and Scotch-Irish, beginning in 1740.

Early English settlements were made around rivers and creeks. Eventually these settlements led to a cotton plantation culture which gave way to "share cropping" following the War Between the States.

Share cropping, in turn, led to soil depletion and massive erosion of most of the county. And finally, the arrival of the boll weevil in about 1920 finished the cotton industry in Fairfield County. From this adversity, the county has rebounded with a more vigorous and diversified economic base, as discussed herein.

Fairfield County is organized under the Council-Administrator form of government, authorized by the Home Rule Act of 1974. The centerpiece of the governmental complex is the historical Fairfield County Courthouse, constructed in 1823.

For all the changes that have taken place over time, Fairfield, with an area of about 686 square miles and a population density of only 26.5 persons per square mile, remains a predominantly rural area. However, it is being impacted as never before by the expansion of the Greater Columbia Area, and improved accessibility via I-77 through the county.

These changes have and will continue to support the suburbanization of employment facilities in the county. They may also lead to the exurbanization of Winnsboro and Ridgeway, and the suburbanization of areas in closer proximity to Richland County.

These development scenarios surely will alter the landscape and the rural character of Fairfield County. And if left unplanned and uncontrolled, these changes could result in a patchwork of subdivisions, commercial strips, and incompatible industrial uses completely lacking in character or traditional values, compromising rather than enhancing "quality of life" in the county. In addition to creating negative fall-out sometimes associated with development, and lending order to the process,

1 Central Midlands Regional Planning Council, <u>Central Midlands</u> <u>Historic Preservation Survey</u>, 1974.

planning, as advanced in this document, is predicated on the following.

<u>Planning makes sense.</u> You would not build a home without a plan. In fact, very few actions are taken without some sort of plan. Without a plan, the county is in the precarious position of having to respond to issues as they arise without regard to possible long-range implications. The problem with this is that it can and often does place pressure on local officials to address issues that were neither anticipated nor budgeted. It also places with such officials the responsibility of resolving land use problems created by unplanned development---problems of land use incompatibility and infringement of property rights, among others.

<u>Planning can save money.</u> The county and other service providers can tie fiscal planning into the land use planning process so that major capital items such as water, sewer, schools, recreation facilities, fire protection, etc. will be provided in a timely efficient manner, to accommodate future development. And this can save money in right-of-way and public site acquisitions, along with other money-saving ventures.

<u>Planning can ensure project coordination.</u> Advance planning can ensure that roads intersect at proper angles, and that traffic movement is not incumbered by poor street design, unlimited curb cuts, and access points.

Finally, Planning is required by the State if land use regulations (zoning) and development controls are to be adopted by the county. According to 6-7-710 of the S.C. Code of Laws, 1976, "Land use regulations <u>shall</u> be made in accordance with a Comprehensive Plan".

More to the point, this Plan is intended to promote an arrangement of land use, circulation and services which will encourage and contribute to the economic, social and physical health, safety, welfare and convenience of the county. It is further intended to guide development and change to meet existing and anticipated needs and conditions; to contribute to a healthy and pleasant environment; to balance growth and stability; to reflect economic potentialities and limitations; to protect investment to the extent reasonable and feasible; and to serve as a basis for regulating land use and the development process.

The following sections dimension the various elements of the Plan and include a strategy for implementation.

## SECTION I

#### DEMOGRAPHIC AND ECONOMIC OVERVIEW

This initial section of the Plan will dimension the influence of demographics and economics on development and land use in Fairfield County.

Characteristics of the population are studied over time to determine trends, composition, distribution and related information essential to the planning process. The economic base also is assessed in terms of its influence on existing and future development.

#### DEMOGRAPHIC TRENDS

An awareness of the population base and what it is doing is critical to the development of a Plan. How many people are we planning for? What is the trend? What are the characteristics of the population? Where is growth taking place?

The answer to these questions will tell us much about what to expect in the way of future land use and intensity of development.

The official 1990 Census places the number of county residents at 22,295, up 7.7 percent over the 1980 population, which was up 3.5 percent over 1970. This 20-year growth record reverses an earlier out-migration trend recorded in the 1960s, when the county population declined by 3.4 percent.

Overall, growth of the county has not kept pace with that of the State, which recorded gains of 20 percent and 11.7 percent, respectively during the 70s and 80s. However, growth in two areas of the county, Ridgeway and Winnsboro south, closely mirrors the average rate of increase for the State.

The Ridgeway Census County Division (see Map I) increased by 13.4 percent between 1970 and 1980, and by 12.1 percent between 1980 and 1990, above the state average of 11.1 percent. Increased growth in Winnsboro south was even stronger during the 80s, although the rate was slightly less at 9.6 percent.

The growth of these areas may be attributed to improved linkage by I-77 to the Columbia MSA (Metropolitan Statistical Area), better accessibility to "outside" market areas, and to opening these areas and their inherent amenities to development.

# TABLE I

# DEMOGRAPHIC TRENDS FAIRFIELD COUNTY AND CENSUS COUNTY DIVISIONS

•					Change	3
CENSUS COUNTY DIVISIONS	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>1970-</u>	1980	<u>1980-1990</u>
FAIRFIELD COUNTY	19,999	20,700	22,295	<u>701</u>	- <del>*</del> -3.5	$\frac{NO.}{1,595}$ $\frac{*}{7.7}$
Monticello-Salem Ridgeway Winnsboro North Winnsboro South	2,508 3,465 3,394 10,632	2,366 3,928 3,908 10,498	2,267 4,403 4,119 11,506	-142 463 514 -137	-5.7 13.4 15.1 -1.3	- 99 -4.2 475 12.1 211 5.4 1,008 9.6
South Carolina (000)	2,591	3,122	3,487	531	20.0	365 11.7
PERCENT COUNTY						
Monticello-Salem	12.5	11.4	10.2			
Ridgeway	17.3	19.0	19.7	• .	. :	
Winnsboro North	17.0	18.9	18.5	•		
Winnsboro South	53.2	50.7	51.6	N .		

Source: U.S. Department of Commerce, Bureau of Census, Census of Population, Number of Inhabitants, Selected Years.



The balance of the county has not faired as well over the last 20 years. Winnsboro North CCD had a modest increase, but population has declined in the more rural and remote Monticello-Salem Area. On the positive side, however, the county's growth rate during the 80s more than doubled the rate of growth in the 70s.

#### DEMOGRAPHIC COMPOSITION

To more fully understand the population, we need to take stock of its component parts or characteristics, including gender, age and race.

#### Gender Composition

As a general rule, the female population is larger than its male counterpart. In 1990, the female population in South Carolina accounted for 51.4 percent of the total. Fairfield County by comparison, had an even higher ratio of females, 52.1 percent. On average the county's female population has fluctuated between 51 and 52 percent of the total over the last 20 years. However, the trend is definitely up, as shown by Table II.

Nationally, the sexes are about evenly distributed in the pre-teen and teenage years, but with age the ratio generally becomes imbalanced on the female side. While the process is gradual, females at age 65 and over are in the majority position. And this pattern is also prevalent in Fairfield County where in 1990, females comprised over eight percent of the total population, while males accounted for only 5 percent.

From a planning standpoint, this trend has little affect on land use planning, except for the obvious housing implications. More people of any one sex, generally produces more one-person households, favoring smaller units and aggregate housing facilities.

#### Age Composition

Two noteworthy trends are taking place in the age composition of county residents. One, the number of children and adolescents (under the age of 18) is declining sharpely. And this decline surely will show up in future population counts, if not off-set by in-migration. Two, the number of elderly persons (65 and older) is increasing significantly.

From 41 percent of the total population in 1970, the under 18 population group dropped to 28 percent by 1990, for a 22 percent decline. Conversely, the elderly population grew from nine percent to 14 percent of the total, for a 64 percent



## TABLE II

GENDER COMPOSITION AND TRENDS FAIRFIELD COUNTY, 1970-1990

		1970		1980		1990	
		<u>No.</u>	alo	<u>No.</u>	alo	<u>No.</u>	<u>90</u>
Males		9,756	48.8	9,993	48.3	10,689	47.9
Over	65	776	03.9	959	04.6	1,206	05.4
Females		10,243	51.2	10,707	51.7	11,606	52.1
Over	65	1,083	05.4	1,482	07.2	1,835	08.2

Elderly Trends By Gender 2000 1835 1482 1500 1208 1083 1000 -95 776 500 -0 + į 1970 1980 1990 Females over 65

Males over 65

increase. The more productive age group, between 18 and 64, also increased from 50 to 58 percent during this period, but at a slower rate.

## Table III

Comparative Trends In Selected Age Groups, Fairfield County and South Carolina, 1970-1990

Percent	: Population
<u>1970</u>	<u>1990</u>
.41 .37	.28 .24
.09	.14
	Percent <u>1970</u> .41 .37 .09 .07

Source: U.S. Bureau of Census, <u>General Population</u> <u>Characteristics</u>, South Carolina, Selected Years.

The concern for what is happening in Fairfield County, if there is cause for concern, is the decline in the young. But the situation in Fairfield County is not out of line with the trend in the State, where the under 18 age group declined over the last 20 years from 37 to 24 percent of the population. Actually, the ratio of young people in Fairfield County is higher than the state average.

The ratio of elderly persons also is higher in Fairfield County than in the state. The reason lies logically in increased longevity and stability. Fairfield County's aging population is staying home, as opposed to migrating to retirement areas.

The implications of this from a planning and land use standpoint suggest that more attention be placed on addressing the needs of an aging population, i.e. congregate housing, nursing homes, health care facilities, passive parks, public transportation, small lot subdivisions, patio and multi-family dwellings, etc.

TABLE	IV
-------	----

AGE COMPOSITION AND TRENDS FAIRFIELD COUNTY, 1970-1990 1970 1980 1990 NO. ह NO. 8 <u>NO.</u> 8 Under 18 8,172 .6,764 6,343 .28 .41 .33 12,911 .58 18 - 64 9,968 11,495 .50 .55 2,441 3,041 65 and over .14 1,859 .09 .12 100 . 22,295 19,999 20,700 TOTAL 100 100

Age Composition and Trends 14000 -12000 -10000 8000 -6000 -4000 -2000 -0 1970 1980 1990 Under 18 18 - 64 65 +

### Racial Composition

Looking now at the racial composition, we find that the county is composed predominantly of African-Americans. The White population comprises only 42 percent of the total, but has shown a slight percentage increase over the last 20 years. Both groups grew by about eight percent over the last 10 years, up from the previous 10-year period, between 1970 and 1980.

Interestingly, the most dramatic rate increase has come in "other" minorities, i.e. Indian, Eskimo, Asian, etc. From only two persons in this category in 1970, the number was up to 57 by 1990. In terms of overall make-up, these groups still comprise only a very small component of the county's population, less than one percent.

In sum, racial composition appears to be fairly stable in Fairfield County, as shown by Table V. And based on the rate of change over the last 20 years, the ratio is not expected to change appreciably in the future, although a few areas may become more concentrated with one or the other major races.

#### DEMOGRAPHIC FORECAST

That Fairfield County is in a 20-year growth mode, following a population decline in the 1960s, is an encouraging sign. Will it carry into the future and if so, what are the expectations? The answer to these questions is fundamental to the planning process. Planning is, after all, a people-oriented exercise. To dimension the size and distribution of future populations is elementary.

Future population forecasts for the county do indeed indicate a continuation of the growth trend. From a 1990 population of 22,295, the county's population is forecast to increase moderately to nearly 25,000 by 2010. Growth increments at 5-year intervals are shown by Table VI.

For planning purposes, it is not enough simply to dimension the future size of the population. It is of equal importance to determine where within the county population shifts and changes are expected to occur---to establish a distribution pattern.

Toward this end, we have extrapolated from the total for the four Census Divisions in the county, based on established trends and conditions within each. The results of this exercise are shown on Table VI.

Three of the four divisions are projected to increase in population, with the larger increase projected for Winnsborg South. Also population gains are forecast for Ridgeway and TABLE V

RACIAL COMPOSITION AND TRENDS FAIRFIELD COUNTY, 1970-1990

				CHANGE			
				1970	0-1980	1980-	1990
NUMBER	<u>1970</u>	<u>1980</u>	1990	<u>NO.</u>	<u>6</u>	NO.	<u>9</u>
White	8,115	8,580	9,244	465	.06	664	.08
African-Amer.	11,882	12,083	12,994	201	. 02	911	.08
Other	2	37	57	35	17.5	20	.54



TABLE VI

# DEMOGRAPHIC FORECAST FAIRFIELD COUNTY AND CENSUS COUNTY DIVISIONS

	2000	<u>2005</u>	2010	<u>2015</u>
FAIRFIELD COUNTY	23,800	24,300	24,800	25,500
Monticello-Salem	2,200	2,150	2,100	2,000
Ridgeway	4,850	5,050	5,200	5,500
Winnsboro North	4,550	4,600	4,700	4,800
Winnsboro South	12,200	12,500	12,800	13,200

Source: The Strom Thurmond Institute of Government, Forecast of Population for South Carolina's Census County Divisions, 1991; adjusted by Vismor & Associates, Inc. to reflect 1990 Census counts, and county projections by the S.C. State Data Center.



Winnsboro North Census Divisions. Only the Monticello-Salem Division is projected to decline, but not significantly.

Projected increases in the three "growth" divisions are predicated in part on their proximity to I-77, improved accessibility and enhanced development potential.

Continued polarization of population in the Winnsboro area is projected, together with relatively strong growth in the Ridgeway and Lake Wateree Areas.

At this time, no major deviations from existing patterns of development are projected, only expansions.

#### HOUSING

#### Occupancy Characteristics

To be expected, the increase in housing units over the last 20 years (between 1970 and 1990) far exceeded the increase in population. The reason, of course, is that the number of persons per household declined during this period from 3.80 to 2.93. At the same time, the number of one-person households increased from 14 to 22 percent of all households.

#### Table VII

#### Household Characteristics Fairfield County

	<u>1970</u>	<u>1980</u>	<u>1990</u>
Number of Households	5,284	6,355	7,467
Persons Per Household	3.80	3.21	2.93
Number of One-Person Households Percent Total	741 .14	1,231 .19	1,634

Source: U.S. Bureau of Census, <u>Detailed Housing Characteristics</u>, Selected Years.

This trend toward smaller households bodes well for the housing industry, as smaller households translate into more housing just to accommodate the same number of people. And in a growth situation, the results are compounded as evidenced by a 17 percent increase in housing between 1970 and 1980, and an 18

#### percent increase during the following decade.

Another positive sign for the housing industry is the increase in home ownership. Owner occupancy increased by 40 percent between 1970 and 1980, and again by 20 percent between 1980 and 1990. The ratio of owner-occupied dwellings also increased from 60 percent of all housing units in 1970 to 72 percent by 1990.

The number of rental and vacant units also increased over the last 10 years, from 1980 to 1990.

The high rate of owner occupancy is a sign of stability and vesting in the county, and speaks to the commitment of more permanent residency.

### Structural Characteristics

Single-family, detached homes dominate the housing market in Fairfield County, but not to the extent they once did. From 92 percent of all housing in 1970, the number of single-family units dropped to 69 percent of the total by 1990. This decline was recorded while the actual number of single-family housing units was increasing by 48 percent.

The big shift in structural characteristics has been in the introduction of the manufactured house or mobile home. From only three percent of all housing in 1970, mobile homes provided in 1990, 23 percent of the county's housing. This is a direct response to the need for alternative low-cost housing. Additionally, apartments, condominiums, duplexes and other multi-family dwellings now provide about eight percent of all housing, up from five percent in 1970.

Significantly, the housing shifts we are seeing in Fairfield County are not out-of-line with what is happening in the State and the Nation. The rising cost of single-family housing has created a market for alternative forms of multi-family dwellings and mobile homes. And the county may expect an even larger share of the market to be absorbed by such housing in the future.

The major fall-out of this will be in reconciling differences between housing types---to enhance compatibility. Additionally, mobile home development practices to date have failed to consistently produce safe, quality environs.

In light of what is happening, careful land use planning is needed to ameliorate inherent differences between such housing, lessen the impact of multi-family and mobile homes on established community life-style, and ensure the safety of such housing.



# TABLE VIII

# HOUSING OCCUPANCY CHARACTERISTICS, FAIRFIELD COUNTY, 1970-1990

			CHA	NGE	
			1970	-1990	
· ·	<u>1970</u>	<u>1990</u>	NO.	<u> </u>	
Year-Round Housing Units	5,887	8,115	2,228	38	
Owner-occupied	3,497	5,831	2,334	67	
Percent	.60	.72			
Renter-occupied	1,729	1,636	- 93	-05	
Percent	.29	.20	- 13	-02	
Vacant	661	648			
Percent	.11	.08			
Seasonal Recreational					
Housing Units	120 ·	615	495	413	
· · · · · ·					

Source: U.S. Bureau of Census, <u>Detailed Housing Characteristics</u>, 1970, 1980, 1990.



# TABLE IX

# HOUSING STRUCTURAL CHARACTERISTICS FAIRFIELD COUNTY, 1970-1990

Structural			CHANGE 1970-1990		
<u>Characteristics</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>No.</u>	
Single-family	5,427	5,321	6,037	610 <sup>.</sup>	0.11
Multi-family	284	752	712	428	1.51
Mobile Homes	176	807	1,981	1,805	10.26
TOTAL	5,887	6,880	8,730	2,843	

Source: <u>Ibid.</u>, <u>Detailed Housing Characteristics</u>, 1970, 1980, 1990.

.....

Structural Characteristics

## Financial Characteristics

The financial characteristics of owner-occupied housing indicate that a majority of the homes in Fairfield County are relatively low value, and perhaps structurally deficient in some way. Over 53 percent of all owner-occupied housing is valued at less than \$50,000, compared with only 37 percent statewide. Conversely, less than 10 percent of all housing is valued at or above \$100,000. The median housing value in the county is only \$47,500.

These characteristics tell us a lot about living conditions in the county, which appear to reflect a more basic existence for the majority of home owners, irrespective of relative housing and land costs.

#### Table X

## Housing Costs and Values Fairfield County, 1990

	Owner-Occupied <u>No. Units</u>	Dwellings <u>Ratio</u>
Less than \$50,000	1,919	. 53
\$50,000 - 99,999	1,380	.38
100,000 -149,999	232	.06
150,000 -199,999	60	.02
200,000 plus	26	•01

MEDIAN VALUE \$47,500

Source: Ibid.

#### INCOME

Income is a definitive measure of life style. As such, it must be considered "below average" in Fairfield County, based on comparables to the State.

Fairfield County residents have per capita incomes approximately 24 percent below the state average. And over the last eight years, from 1981 to 1989, there has been relatively little change in relation to the state.

# Table XI Per Capita Income Trends, Fairfield County and the State 1983-1993

	Fairfield (	County State	<u>Ratio T</u>	o State
1993	13,770	16,861	.82	
1991	13,479	15,391	.88	
1989	10,355	13,624	.76	
1987	7,538	9,967	.76	•
1985	6,565	8,890	.74	•
1983	5,926	7,830	.76	

Source: State Budget and Control Board, Division of Research and Statistical Services, <u>Newsletter Vol. 10, No. 2</u>, Spring 1990.

These data account for the relatively low housing values discussed previously and establish a need for additional economic development and for readying a work force to accommodate such development.

Income may affect the use of land from several directions. Certainly, many private commercial enterprises consider area income characteristics before locating a new establishment or expanding an existing one. Income levels indicate industrial wage scales a new manufacturer may face. Also, certain public facilities and programs are geared toward lower income areas.

The affect of income on land use is most vividly expressed in the quality of development. Any improvement usually is contingent on economic growth, resulting in higher paying jobs and/or federal subsidies, i.e. housing and community development block grant funds.

#### BUSINESS ACTIVITY

Business activity in the county generally has been on the rise. The number of service and wholesale establishments increased between 1977 and 1987. And the number of retail establishments held firm at 90. Employment and sales also increased, as shown by Table XII.

From 38 service establishments in 1977, the number increased to 48 by 1987, creating approximately 173 new jobs in the service

sector. Job development was not as significant in the other two major business categories (retail and wholesale trade), but increases were recorded in both.

Still the major business activity in Fairfield County is in retail trade, accounting in 1987 for 58 percent of the business establishments, 62 percent of the jobs in business, and 70 percent of sales. While the largest gains have been in the service sector, it is still relatively small compared with the retail sector.

On closer examination of the service sector, we see that health services lead the way in the number of establishments, in spite of a decline between 1982 and 1987. Following in order of numbers of establishments are automotive, business, amusement, legal, hotel, personal, engineering and research.

With respect to retail establishments, the leading business activity is in food stores, followed by eating and drinking establishments, gas stations, general merchandise, building materials and hardware, drug, auto dealers, apparel shops and furniture stores.

Most of these establishments are not in the unincorporated areas of the county however. They are located in the Towns of Winnsboro and Ridgeway, where the population is sufficiently concentrated to support business activities and enterprises. As a result, their impact on land use and development of the unincorporated areas is relatively limited at this time. That is not to say that suburbanization and movement of such activities will not impact the countryside in the future. Indeed, it is guite likely as the ties inevitably strengthen between Fairfield and the Columbia MSA (Metropolitan Statistical Area). And planning to accommodate these potential occurrences is part of what this Plan is all about.

#### EMPLOYMENT

Employment and job opportunities do more to influence growth and development than perhaps any other factor. In fact, studies show that the creation of 100 new industrial jobs will generate 68 new non-manufacturing jobs, one new retail establishment, and 67 additional families, among other things.

Thirty-one percent of all non-agricultural jobs in Fairfield County were in manufacturing in 1994, down five percent over the last eight years. The largest employer is in transportation equipment, resulting from the location of Mack Trucks in 1987, followed by apparel and other textiles.

In the area of non-manufacturing, which provides about 65
percent of all non-agricultural jobs, government is the largest employer, accounting for approximately 29 percent or over one out of every four non-manufacturing jobs. The service sector is the second leading employer, followed in order by wholesale and retail trade, transportation and public utilities. Construction, mining, finance, insurance and real estate account for appreciable smaller numbers of jobs as shown by Table XIV.

Significantly, both manufacturing and non-manufacturing employment are up over the last eight years, although declines in some segments of the economy have been recorded since 1986. Nonmanufacturing and service jobs increasingly are out-distancing manufacturing employment statewide, as is the case in Fairfield County. The ratio for South Carolina declined from 27 percent in 1986 to 29 percent by 1994. In Fairfield County the decline was from 36 percent to 31 percent.

From this, it may be concluded that Fairfield's economy, albeit small, is well-balanced, with a stronger than average showing in manufacturing employment.

Most industrial plants are located in the Winnsboro area. But with the opening of the Walter Brown Industrial Park, off I-77, there has been a shift to the park since its opening in 1993.

The success of the Walter Brown Park has stirred the county to focus on the development of additional parks in the SC-34 corridor between Ridgeway and Winnsboro, supported by the facilitation of this area with water and sewer infrastructure.

The county's civilian labor force in support of industrial and economic development, increased by 23 percent between 1986 and 1994. Still, the unemployment rate is relatively high, at 9.7 percent compared with only 6.3 percent for the state.

**Employment Trends** 700 -600 500 -, , <del>, , ,</del> 400 300 200 -100 0 --l 1982 1987 1992 Retail Wholesale Services

# TABLE XII FAIRFIELD COUNTY TRENDS IN BUSINESS, EMPLOYMENT AND SALES, 1982-1992

	<u>Business Es</u>	tablishments*	
	<u>1982</u>	<u>1987</u>	<u>1992</u>
Wholesale Trade	14	17	9
Retail Trade	90	90	8 <u>6</u>
Service Industry	45	48	55
Total	149	155	150
	Employ	<u>ment</u>	
Wholesale Trade	60	101	68
Retail Trade	491	491	605
Service Industry	177	248	629
Total	728	930	1302
	Annual	<u>Sales (000)</u>	
Wholesale Trade	\$19,389	\$18,202	\$17 <b>,</b> 788
Retail Trade	37,920	60,784	57,369
Service Industry	5,231	7,528	18,898
Total	\$62,540	\$86,514	\$94,055
	•		

\*Establishments with payrolls.

# TABLE XIII

# FAIRFIELD COUNTY PROFILE OF SERVICE AND RETAIL SECTORS 1982 - 1992

				1982-1992
	<u>1982</u>	<u>1987</u>	<u>1992</u>	<u>Change</u>
No. Service Establishm	ents*			
Total ·	45	48	50	5
Hotels, lodging	3	4	3	0
Personal services	NA	4	8	NA
Business services	NA	5	7	NA
Automotive services	2	6	3	1
Misc. Repair services	NA	3	1	NA
Amusement, recreation	2	5	5	3
Health services	13	10	12	- <b></b> - <b>1</b>
Legal services	6	5	5	-1
Social services	NA	1	1	NA
Engineering, account.				
research services	NA.	4	5	NA
No. Retail Trade Estab	lishmen	ts*		
Total	90	90	86	-4
Building Mat., Hardwar	e 4	6	5	1
Genl. Mdse.	7	8	7	0
Food	20	18	19	-1
Auto dealers	6	5	7 ·	-1.
Gas stations	9	12	10	1
Apparel & access.	6	5	4	-2
Furniture, home furn.	5	4	4	-1
Eating & drinking	16	16	17	1
Drug	7	6	4	-3
Misc. Retail	10	10	9	-1

\*Establishments with payrolls NA = Not available

Source: U.S. Department of Commerce, Bureau of Census, <u>Census of Service Industries, Geographic Area Services</u>, South Carolina, Selected Years.



# TABLE XIV FAIRFIELD COUNTY NON-AGRICULTURAL WAGE AND SALARY EMPLOYMENT TRENDS, 1986-1994

. 2.

	<u>1986</u>	<u>1990</u>	<u>1994</u>
TOTAL	6,330	7,400	7,620
Manufacturing	2,250	2,550	2,330
Non-manufacturing	4,080	4,850	5,290
Mining Transportation 6	270	350	370
Public Utility	1,060	920	1,060
Trade Financo Incuranco	670	1,040	1,180
& Real Estate	150	110	100
Services (1) Government	810 1,110	1,130 1,300	1,070 1,520

(1) Included in services are those services related to agriculture, as well as the wide range of services to individual and business establishments.

# TABLE XV

# MANUFACTURING AND INDUSTRIAL INVENTORY FAIRFIELD COUNTY, 1996

PLANT LOCATIONS SINCE 1990		NO. EMPLOYEES
Fairfield Fabricators Lang-Makra Isola USA Gividi Inc. (under constructi	.on)	6 40 110 80
Warner-Makat (under construct	ion)	35
	TOTAL	271
PLANT LOCATIONS BETWEEN 1980-1990		
Fuji Copian Corp. JPM Company of SC Mack Trucks, Inc. Carolina Apparel Kennecott Ridgeway Mining Co. Playcraft	•	180 108 894 125 139 13
·	TOTAL	1459
PLANT LOCATIONS PRIOR TO 1980		
Tarmac America Inc. D & D Foundry Pigeon Granite Co. Phillips Granite Co. Manhatten Shirt Standard Products Co. Uniroyal Tire Winnsboro Concrete Winnsboro Plywood Winnsboro Veneer Co.	• •	12 9 5 11 176 451 299 8 73 6
	TOTAL	1050
GRAND TO	TAL	2780

Source: S.C. Industrial Directory, 1996; local sources.



# TABLE XVI

## FAIRFIELD COUNTY LABOR FORCE TRENDS, 1986-1994

	Annual Average					
	<u>1986</u>	<u>1988</u>	1990	<u>1992</u>	<u>1994</u>	
Civilian Labor Force	8,880	10,550	10,050	10,760	10,960	
Employment, Total	8,090	9,960	9,100	9,790	9,890	
Unemployment	790	570	950	970	1,070	
Percent Labor Force	8.9%	5.4%	9.5%	9.0%	9.78	
Source: S.C. Employment Se Industry.	ecurity Com	mission, <u>S</u>	South Caro	lina's La	bor Force	iņ

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# SECTION II

#### ENVIRONMENTAL FEATURES

There are numerous natural environmental conditions that influence the potential use of land. Man has little short-run control over such conditions as climate, geology, soils, wetlands, flood waters, topography, etc. Yet these conditions can and often do present engineering, safety, and economic barriers which limit development potential. Further, unwise use of land in "environmentally sensitive areas" may harm or destroy valuable natural resources. Thus, it is important, from a planning and development perspective, to be aware of the presence and extent of environmental constraints and resources.

This section will dimension such features and conditions to determine their impact on existing and future development in Fairfield Couty.

# POSITION IN THE STATE

Fairfield County is positioned on the divide between the Piedmont and the Sandhills. The majority of the county is in the Southern Piedmont Land Resource Area, but about 2,000 acres in the southeast corner lie within the Sand Hills Area.

Fairfield County is located in the Central Midlands Region of South Carolina and lies principally between Chester and Richland Counties north to south, and Kershaw and Newberry Counties east to west. The elevation of the county ranges from slightly less than 200 feet at the confluence of the Broad and Little Rivers to about 625 feet in the upper part of the county.

The county is situated on I-77, between the larger market areas of Columbia and Charlotte, North Carolina, in a position to capitalize on the economic expansion of and growing ties between the two areas.

# CLIMATE

2

Fairfield County, like the rest of South Carolina, has a temperate climate. This is typified by ample rainfall in all seasons, short and usually mild winters, and long, warm summers.

2 U. S. Department of Agriculture, SCS, <u>Soil Survey of Chester</u> and Fairfield Counties, <u>South Carolina</u>, 1982. While there are daily weather variations between specific locations, the annual averages in all parts of the county is similar.

Rainfall is fairly well distributed throughout the year. Winter rainfall is mostly associated with frontal weather; and summer rainfall, with tropical air masses. Winter rains are lighter and steadier than the summer storms which are often violent cloud-bursts of short duration. Annual average precipitation is about 47 inches, sufficient for most crops.

In winter, the average temperature is 44 degrees F. with an average daily minimum of 31 degrees. In summer, the average temperature is 78 degrees, and the average daily maximum is 90 degrees.

Additionally, the climate is conducive to a wide range of outdoor recreational and economic pursuits. Clearly, therefore, such conditions are favorable to future growth and development.

#### GEOLOGIC FORMATIONS

. 3

Nine geologic units underlie Fairfield County. They are: metamorphic granite, granitoid gneiss, mica gneiss, amphibolite, slate and argillites, metavolcanic rock, igneour rock, and gabbro granite units.

The slates and argillites and the metavolcanic rock geologic units, part of the Carolina Slate Belt, are in the southern part of Fairfield County. Slate is a hardened shale. Argillite is a baked clay consisting of fine-grained clastic particles. Metavolcanic rock consists of fine crystalline minerals that are likely to form silts and clays when weathered. The slates and argillites weather rapidly, but the metavolcanic rock weathers at a much slower rate.

Coastal Plain sediment is principally the sands and clays deposited during changes in sea level. The Coastal Plain sediment in the southeastern part of Fairfield County is part of the Tuscaloosa Formation.

Gabbro is a dark, basic igneous rock that is mainly of dark feldspar. It is resistant to weathering except where fractured.

Amphibolite, which means many varieties, consists of dark gray, green, and black iron, magnesium, and silicate minerals, which are generally basic. It is not subject to rapid weathering.

3 Ibid.

Intrusive granite and metamorphic granite are generally high in silicate minerals and feldspar and include some mafic minerals. Both are resistant to weathering except where fractured.

Two different geologic units of gneiss, mica gneiss and granitoid gneiss, occur in Fairfield County. Gneiss is a metamorphic rock consisting of various granular minerals in alternate bands. Mica gneiss is dominantly mica but also contains large amounts of feldspar and quartz. Granitoid gneiss has a considerable amount of quartz. Mica gneiss weathers at a moderate rate, but granitoid gneiss is resistant to weathering.

# LEGEND

QKu Coastal Plain PPgb Gabbro Pgi Intrusive Granite COgm Metamorphic Granite COgg Granitoid Gneiss COmg Mica Gneiss COmg Amphibolite Csa Slate and Argillite Cmv Metavolcanic Rock



# SOILS

Soils generally are assessed in terms of their suitability for agricultural purposes and/or urban development --- two extreme opposite Unfortunately, lands best suited for uses. or agricultural use fewest have the constraints to urban development. And since development generally follows the path of least resistance, other factors being equal, there is always the potential for conflict whenever such lands exist in an urbanizing environment.

There are 11 soil associations or groups in Fairfield County, with differing characteristics. They are general by definition, requiring more site specific analysis for individual properties, but are helpful as a guide to development, which is the intent of this Plan. A brief description of each follows.

4 Ibid.

(Note: Numbers correspond to accompanying map assignment.)

# 1. <u>Chewacla-Toccoa</u>

These soils range from poorly drained to well drained. They are nearly level, loamy, and subject to flooding. They are found on broad flood plains along the Broad River comprising about one percent of the soils in Fairfield County. About 60 percent of the unit is Chewacla soils, 30 percent is Toccoa soils, and 10 percent is soils of minor extent.

Chewacla soils are deep and somewhat poorly drained. The subsoil is brown in the upper part and grayish brown or gray in the middle and lower parts. Toccoa soils are deep and well drained. They have a reddish brown underlying horizon.

This unit is mainly woodland. Some tracts are pasture. Flooding and wetness pose severe limitations for cultivated crops as well as urban development.

## 2. <u>Vaucluse-Blanton</u>

These soils are well drained to moderately well drained, gently sloping, and loamy. They are found in the Sand Hills of Fairfield County, comprising less than one percent of the soils. About 80 percent of this unit is Vaucluse soils, 11 percent is Blanton soils, and the remaining 9 percent is soils of minor we extent.

Vaucluse soils are well drained and are slowly permeable. They have a sandy surface layer less than 20 inches thick. Blanton soils are moderately well drained, are moderately permeable, and have a sandy surface layer thickness of 40 inches or more.

This unit is mainly pasture and woodland. A few acres are cultivated. A restricted root zone is the main limitation in the Vaucluse soils, and droughtiness is the main limitation in the Blanton soils.

Suitability is fair to poor for crops and only fair for woodland. Suitability is good to fair for residential and other urban uses.

#### 3. <u>Wilkes-Cataula-Winnsboro</u>

These are well drained, gently sloping to steep, moderately deep and deep clayey soils. The gently sloping to steep soils are found in the western part of Fairfield County. This unit makes up approximately 12 percent of the soils in Fairfield County, of which about 59 percent are Wilkes soils, 22 percent Cataula, 13 percent Winnsboro, and 6 percent is soils of minor extent.

All these soils are well drained. Wilkes soils are moderately deep, are moderately permeable with brown or olive subsoil. Cataula soils are deep, have a red subsoil, and are slowly permeable. Winnsboro soils are deep, slowly permeable, and have a brown subsoil.

Cataula soils and the gently sloping and sloping Winnsboro soils are on narrow to broad irregularly shaped ridgetops. Wilkes soils and the moderately steep Winnsboro soils are on side slopes adjacent to drainageways.

This unit is mainly pasture and woodland. Some tracts are cultivated. Slope is the main limitation for cultivated crops. A restricted root zone is a limitation in Cataula soils.

In Wilkes soils and the moderately steep Winnsboro soils, suitability is poor for crops and pasture because of the slope. In Cataula soils and the gently sloping Winnsboro soils, it is good to fair for crops. Suitability is fair for woodland throughout and is generally poor for residential and other urban uses.

#### 4. Wilkes-Winnsboro-Mecklenburg

These are well drained, gently sloping to steep, moderately deep and deep clayey soils. These soils occur as broad areas throughout Fairfield County, comprising about 23 percent of the soils. About 49 percent of this association is Wilkes soils, 34 percent Winnsboro, 8 percent Mecklenburg, and 9 percent is soils of minor extent.

All these soils are well drained. Wilkes soils are moderately deep, have moderately slow permeability, and have a brown or olive subsoil. Winnsboro soils are deep, have slow permeability, and a brown subsoil. Mecklenburg soils are deep, have slow permeability and red subsoil.

This unit is mainly pasture and woodland, although some tracts are cultivated.

In Wilkes soils and the moderately steep Winnsboro soils, suitability is poor for crops and pasture because of the slope. In Mecklenburg soils and the gently sloping and sloping Winnsboro soils, it is good to fair for crops. Suitability is fair for woodland throughout the unit. It is poor for residential and other urban uses in most areas because of the steepness of slope, but it is fair in Mecklenburg soils and the gently sloping and sloping Winnsboro soils.

# 5. <u>Wilkes-Hiwassee-Madison</u>

These are well drained, gently sloping to steep, moderately deep and deep clayey soils. The gently sloping to steep soils are found in the northwestern part of Fairfield County and make up approximately 2 percent of the county. About 54 percent of the unit is in Wilkes soils, 32 percent in Hiwassee, 11 percent in Madison, and the balance in minor soils.

All these soils are well drained. Wilkes soils are moderately deep, moderately permeable, and have a brown or olive subsoil. Hiwassee soils are deep, moderately permeable, and have a dark red subsoil. Madison soils are deep, moderately permeable and have a red subsoil.

Hiwassee soils and the gently sloping and sloping Madison soils are on moderate to broad ridgetops. Wilkes soils and the moderately steep Madison soils are on side slopes adjacent to drainageways.

This unit is mainly in pasture and woodland, although some tracts are cultivated.

In Wilkes soils and the moderately steep Madison soils, suitability is poor for crops and fair to poor for pasture because of slope. In Hiwassee soils and the gently sloping and sloping Madison soils, it is good to fair for crops and pasture. Suitability for woodland is good to fair throughout the unit. It is poor for residential or other urban uses in most of the unit because of steepness of the slope, but is suited to development in Hiwassee soils and in the gently sloping and sloping Madison soils.

## 6. <u>Appling-Rion-Wateree</u>

These are well drained, gently sloping to steep, deep and moderately deep clayey and loamy soils. They occur throughout Fairfield County, making up about three percent of the soils. About 51 percent of the unit is Appling, 36 percent is Rion, 6 percent is Wateree soils, and 7 percent is soils of minor extent.

Appling and Rion soils are well drained, deep, and moderately permeable. They have a subsoil of brown or yellow sandy clay loam. Wateree soils are excessively drained, moderately deep, and moderately to rapidly permeable. They have a subsoil of brown or yellow sandy loam. Appling soils are found on broad, irregularly shaped ridges. Rion and Wateree soils are generally on narrow to broad side slopes.

This unit is mainly pasture and woodland, although some tracts are cultivated. In Appling soils suitability is good to fair for crops and good for pasture. In Rion and Wateree soils

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suitability is poor for crops and fair to poor for pasture because of slope and droughtiness. Suitability is good to fair for woodland throughout the unit. It is poor for residential and other urban uses in the moderately steep or steep Rion and Wateree soils, but it is good to fair in the rest of the unit.

## 7. <u>Cecil-Pacolet-Appling</u>

These are well drained, gently sloping to moderately steep, deep clayey and loamy soils. They are found throughout Fairfield County. They make up about 19 percent of the soils. Forty-six percent of the unit is in Cecil soils, 32 percent in Pacolet, 6 percent in Appling, and 16 percent in soils of minor extent.

These soils are well drained, deep, and moderately permeable. Cecil and Pacolet soils have a red subsoil. Appling soils have a yellow or yellowish red subsoil. Cecil and Appling soils are on moderate to broad ridgetops. Pacolet soils are found mainly on side slopes adjacent to drainageways.

This unit is mainly pasture and woodland, however, some tracts are cultivated.

Cecil and Appling soils are rated good to fair for crops and pasture. Pacolet soils are generally unsuited for crops and pasture because of slope. Suitability is good for woodland throughout the unit. It is good to fair for residential and other urban uses in Cecil and Appling soils, but relatively poor in Pacolet soils.

# 8. <u>Madison-Cecil-Hiwassee</u>

These are well drained, gently sloping to moderately steep, deep clayey soils. They make up about 10 percent of the county's soils. About 40 percent of this unit is in Madison soils, 15 percent in Cecil, 14 percent in Hiwassee, and 31 percent in soils of minor extent.

All these soils are deep, well drained, moderately permeable, and have a red subsoil. Hiwassee soils, and the gently sloping and sloping Madison soils are found on narrow to broad ridgetops. Moderately steep Madison soils are on side slopes adjacent to drainageways.

This unit is mainly in pasture and woodland although some tracts are cultivated. Suitability for crops and pasture is generally good to fair. Suitability is good for woodland throughout most of the unit. Suitability for residential and urban uses is good to fair.

#### 9. <u>Pacolet-Cataula-Madison</u>

These are well drained, gently sloping to moderately steep, deep clayey soils. They are found principally in the northwestern part of Fairfield County and make up about 5 percent of the soils. Approximately 60 percent of this unit is in Pacolet soils, 23 percent in Cataula soils, 10 percent in Madison soils, and 7 percent in soils of minor extent.

All these soils are well drained and have a red clayey subsoil. Pacolet and Madison soils are deep and moderately permeable. Cataula soils are deep and slowly permeable. Cataula soils and the gently sloping and sloping Madison soils are on ridgetops and short side slopes at the head of and adjacent to shallow drainageways. Pacolet soils and the moderately steep Madison soils are found on side slopes adjacent to drainageways.

This unit is mainly pasture and woodland although some tracts are cultivated.

Suitability is poor for crops and only fair for pasture in Pacolet soils and the moderately steep Madison soils because of the slope. It is good to fair for crops and pasture in Cataula soils and the gently sloping and sloping Madison soils. Suitability is fair for woodland. Suitability is poor for residential and other urban uses in most of this unit because of the steepness of slope, but it is good to fair in Cataula soils and the gently sloping and sloping Madison soils.

#### 10. <u>Wateree-Rion-Helena</u>

These are well drained and moderately well drained, gently sloping to steep, moderately deep and deep loamy and clayey soils.

The gently sloping to steep soils are found in the eastern part of Fairfield County. They make up about 9.5 percent of the county. Within this association about 29 percent is in Wateree soils, 28 percent in Rion soils, 5 percent in Helena soils, and 38 percent in soils of minor extent.

Wateree and Rion soils are well drained, moderately deep or deep, moderately permeable, and loamy. They have a yellow or brown subsoil. Helena soils are moderately well drained, deep, and slowly permeable. They have a brownish yellow subsoil. The sloping to steep Wateree and Rion soils are on narrow to broad side slopes adjacent to drainageways. The gently sloping Helena soils are found on broad ridges and narrow side slopes at the heads of and adjacent to drainageways.



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This unit is mainly used for pasture and woodland, but some small tracts are cultivated.

Wateree and Rion soils have poor suitability for crops and fair to poor suitability for pasture. Helena soils have fair suitability for crops and good to fair suitability for pasture. Suitability for woodland is fair throughout. The suitability for residential use is fair except for the moderately steep and steep Wateree and Rion soils, which have poor suitability for most urban and residential uses.

#### 11. <u>Georgeville-Herndon</u>

These are well drained, gently sloping to strongly sloping, deep clayey soils. They are found mainly in the southern part of Fairfield County, comprising about 15 percent of the soils. About 53 percent of the unit is in Georgeville soils, 21 percent Herndon soils, and 26 percent in soils of minor extent.

Georgeville soils have a red subsoil, and Herndon soils have a brown subsoil. Both have moderate permeability and are high in content of silt throughout.

This unit is used mainly for pasture and woodland. Some tracts are cultivated, however.

Suitability is good to poor for crops, good to fair for pasture, and good for woodland. It is fair to good for residential and other urban uses.

#### Soils With Limitations To Urban Development

Of the 11 associations in the county, the following four pose predominantly severe limitations to urban development, i.e. septic tank filter fields, building foundations, sewage lagoons, etc. In combination, they comprise approximately 36 percent of the county.

<u>No.</u>	
-	

# Association

L	Chewacla-Toccoa
1	Wilkes-Winnsboro-Mecklenburg
5	Appling-Rion-Wateree
10	Wateree-Rion-Helena

A few other associations also contain soils with moderate to severe limitations to urban development, but not to the extent of the above referenced ones. For this reason, the data presented herein should be used only as a guide to development. More in-depth analysis is recommended for the above areas, as well as certain other soils in the county, identified by the <u>Soil</u> <u>Survey of Chester and Fairfield Counties, South Carolina</u>, prepared by the U.S. Department of Agriculture.

To the extent practical, policies and regulations should be designed to channel future development away from areas with severe soil conditions or impose building requirements that would properly overcome any limitations. Such development guidelines should:

- 1. discourage or prohibit large scale urban development in areas without public sewage facilities;
- mandate tie-ons where existing development may be served by a community sewerage system;
- 3. monitor development in flood plain and wetland areas;
- 4. require developers to satisfactorily "overcome" severe soil conditions so as not to adversely affect surrounding properties.

# Soils Best Suited To Agricultural Use

Agricultural land or land with agricultural potential may be classified in two categories, <u>prime farmland</u> and <u>additional</u> <u>farmland</u>. Prime farmland accounts for 14 percent of the total land area in Fairfield County. It is defined as soils having the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops. Additional farmlands of statewide importance comprise another 85,509 acres. They are defined as lands that will economically produce high yields of crops when treated and managed according to acceptable farming methods.

All these lands are not actively cultivated at this time however, according to the latest <u>Census of Agriculture</u> (1987), which shows only 57,293 acres of farmland, with only 19,360 acres in cropland.

#### Table XVII

# Fairfield County Soil Suitability for Agricultural Purposes

	Acres	<u>% Total</u>
Prime Farmland	59,590	.14
Additional Farmland	85,509	.20

Source: U.S. Department of Agriculture, <u>Important Farmlands Map</u>, 1984.



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Prime farmlands are found principally in the southeastern part of the county and around the Town of Winnsboro. They are concentrated south of Winnsboro and S.C. 34 east of Winnsboro to the Kershaw County Line. They are also found in pockets around Lake Wateree and in the northeast corner of the county, south of the Mitford community.

Additional farmlands of statewide importance are generally mingled throughout the prime farmland areas, and extend in scattered form beyond such areas, west and north of Winnsboro, and in the vicinity of Dutchmans Creek.

# Summary Recommendations

In sum, the soil information presented herein is valid for general planning purposes. But because each association has several different soil types, with varying properties, it is imperative that detailed soil borings and tests be made to determine specific limitations and the degree of such limitations before building on or abandoning a potential site. Additional information and assistance are available from the local U.S.D.A. Soil Conservation Service Office.

#### TOPOGRAPHY

Topographic conditions, or slope characteristics, can have a profound influence on development, both in terms of potential use and development costs. As slopes become steeper, development costs may increase accordingly, while the uses to which the land may be put may decrease.

The major environmental concerns associated with new development on steeply sloped land is the potential for soil erosion. The Soil Conservation Service (SCS) has identified slope constraints to urban development in 33 of the 42 soil types in the county. Of these, 22 percent have severe slope characteristics.

Just as is the case with steep slope land, low to no slope land also may hinder urban development. Large expanses of flat land may be poorly drained. Often, flat land development requires extensive drainage networks; and in the case of flood plain property, costly dikes may be necessary. Fortunately, there is virtually no "table-top" flat land of any consequence in Fairfield County. Just as fortunately, the county has few areas so extensively sloped as to preclude urban development. But there are concerns that development practices adequately address slope conditions in Fairfield County so as not to create any drainage, erosion or sedimentation problems.

#### WETLANDS

Wetlands are considered by the state and federal governments to be important to the public interest. As such, they are protected by state and federal laws. Not until April 1986, however, were these laws extended to cover freshwater wetlands. Prior to that time, they were confined to marine and estaurine areas.

This change to the Clean Water Act effectively extends the authority of the U.S. Army Corps of Engineers (Corps) to control wetlands well beyond its previous jurisdiction, to include headwater wetlands and isolated or perched wetlands.

# **Definition**

According to the federal register, "the term wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

The principal criteria for determining wetlands are (1) hydrology, (2) soils, and (3) vegetation. The following definition is generally applicable, but subject to amendment.

#### Hydrology

"The soil is either inundated permanently or periodically saturated to the surface at some time during the growing season of the prevalent vegetation. The period of inundation or soil saturation varies according to the hydrologic/soil moisture regime and occurs in both tidal and nontidal situations.

# <u>Soil</u>

Soils are present and have been classified as hydric, or they possess characteristics that are associated with anaerobic soil conditions.

# Vegetation

The prevalent vegetation consists of macrophytes (species that can be identified without use of ocular magnification) that are typically adapted to habitats having the hydrologic and soil conditions described above. Hydrophytic species due to morphological, physiological, and/or reproductive adaptation(s) have the ability to persist in anaerobic soil conditions."

Evidence of a minimum of one wetland indicator of either of the three parameters must be found for a site to be designated a wetland. This technical approach should always be applied, unless indicators of one or more parameters cannot be found due to human activities such as land clearing and deposition or fill.

Wetlands generally are found in low-lying areas around creeks and rivers. The USDA, <u>S.C. Soil Survey of Chester and Fairfield Counties</u>, has identified four soils in Fairfield as characteristically wet. They are Armenia, Chewacla, Irdell and Helena.

The U.S. Corps of Engineers, in conjunction with other federal and state agencies, is in the process of mapping all such areas in South Carolina, and has completed mapping for the coastal counties. But, wetlands mapping of Fairfield County has yet to be scheduled.

This does not relieve developers of the responsibility under the new law of securing a "determination of wetlands" from the Corps in the event of their existence. <u>Persons intending to</u> <u>engage in activities involving development within or adjacent to</u> <u>wetlands, as herein defined, should contact the Corps of</u> <u>Engineers for a precise determination of jurisdiction and the</u> <u>consequences of such development.</u>

#### Jurisdictional Wetlands

Not all wetlands development will require a permit from the Corps. However, no permit will be issued where wetlands are considered and have been determined by the Corps to perform functions important to the public interest. This includes:

- (a) Wetlands which serve significant natural biological functions, including food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species;
- (b) Wetlands set aside for study of the aquatic environment or as sanctuaries or refuges;
- (c) Wetlands the destruction or alteration of which would affect detrimentally natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, current patterns, or other environmental characteristics;

- (d) Wetlands which are significant in shielding other areas from wave action, erosion, or storm damage. Such wetlands are often associated with barrier beaches, islands, reefs, and bars;
- (e) Wetlands which serve as valuable storage areas for storm and flood waters;
- (f) Wetlands which are ground water discharge areas that maintain minimum baseflows important to aquatic resources and those which are prime natural recharge areas;
- (g) Wetlands which serve significant water purification functions; and
- (h) Wetlands which are unique in nature or scarce in quantity to the region or local area.

Where such conditions are found to exist, the Corps will evaluate each request for development on the basis of projected benefits to be derived from the proposed development in relation to the damage to the wetlands resource.

Suffice to say, the new freshwater wetlands legislation makes development of these areas considerably more tenuous. Where, in the past, development was constrained principally by the simple presence of wetlands, now it is further constrained by the need to plan around or mitigate the use and circumstances of development proposed for such areas. Clearly, the presence of wetlands should alert the developer to the need for a "wetlands determination" before proceeding with a project. Failure to secure a wetlands determination and permit, if required, could result in work stopage, restoration of the project site to its original state, fines, or other compensatory action.

While the extent of wetlands is relatively limited in Fairfield County, care must nonetheless be taken where such lands exist.

#### FLOOD HAZARD AREAS

Flood plains or flood hazard areas, like wetlands, have always restricted the movement of development. And like federal wetlands legislation, federal requirements that local governments regulate and control development in such areas as a prerequisite to flood insurance, has restricted their use for urban purposes even more. In February 1991, Fairfield County enacted a <u>Flood</u> Drainage Prevention Ordinance, to control the development of such areas.

Following this initial move to meet the minimum requirements for participation in the National Flood Insurance Program (NFIP), the county may wish to consider upgrading its Flood Hazard Rating to secure greater savings to those requiring flood insurance.

Under a new community rating system, (CRS), insurers may qualify for 5 to 40 percent savings on their flood policies, depending on the county's classification.

The new "bonus" program is modeled after the ISO (Insurance Service Office) Commercial Risk Services' fire insurance classification program. CRS has 10 classifications from Class 1 to Class 10. As a community or county takes certain steps to reduce the hazards of flooding beyond the minimum to participate in the Flood Insurance Program, it may qualify for a lower rating. Currently, Fairfield County has a Class 10 rating under the new system, but may qualify for a Class 9 rating with only limited improvements or amendments to its current ordinance. This determination may be made with the use of a "Class 9 Quick Check", developed by NFIP.

Clearly, the opportunity to reduce the hazards of flooding and the cost of flood insurance at the same time is worth pursuing although the extent of such conditions is relatively limited in Fairfield County, confined almost exclusively to creek and river beds. It just makes sense.

# SECTION III

#### LAND USE AND INFRASTRUCTURE

That existing land use patterns and infrastructure influence development is clearly evident. Like uses generally attract like uses. Development is dependent on infrastructure. Established commercial areas generally appeal to new commercial development; prestigious residential subdivisions attract new quality residential construction; and many industrial uses seek out the same facilities and areas for development.

It is essential, therefore, to have a thorough understanding of existing land usage, land use patterns, and existing and planned infrastructure in order to adequately assess those areas of the county in which future growth may be expected. A knowledge of "accepted" land use conditions also helps determine the degree of departure, if any, from established patterns of growth and intensity which may be applied to presently undeveloped areas. Toward these ends, a land use and infrastructure survey, inventory and assessment are included as part of this study.

#### EXISTING LAND USE

As stated previously, Fairfield County has about 438,425 acres. It ranks 18th in area among the state's 46 counties.

The largest single use of land is forest, accounting for 87 percent of the total. This includes all public, commercial and non-commercial forests, as well as farm woodlands. Non-forested land, including urban or developed land greater than 10 acres account for the remaining 13 percent of the county.

About three percent of the forested land is in public ownership. The largest is the Sumter National Forest in the northwestern part of the county. Private ownership of forested land is dominated by corporations, individuals and the forest industry. Only six percent of the county's forested land is owned and managed by farmers.

Developed or urban land use comprises only two percent of the county. It is centered in and just beyond the Town of Winnsboro. Urban concentrations are also found along the shores of Wateree Lake, around Ridgeway, in the Mitford community, and to a lesser extent around parts of Monticello Lake and Jenkinsville.



# TABLE XVIII

GENERALIZED LAND USE INVENTORY

	Acres	Percent <u>County</u>
TOTAL AREA	438,425	
FORESTED LAND		
(BY OWNERSHIP)	383,607	.87
Public		
National Forest	11,560	.03
Municipal, County, State	478	.001
Private		
Forest Industries	130,622	.30
Farms (farmers) Corporations	29,027	.06
and Individuals	211,920	.48
NON-FORESTED LAND	54,818	.13
Developed (urban)	7,350	.01
Water	15,416	.04
Other	32,052	.07
	,	

Source: USDA, Soil Conservation Service, <u>Forest Statistics for</u> <u>South Carolina, 1986; Important Farmlands Map, Fairfield County</u>, 1984.

Water areas comprise about four percent of the county, principally in the form of Lake Wateree and the Catawba River, in the eastern extremity, and the Monticello Reservoir and Broad River in the western extremity.

#### Farm Use

The amount of agricultural and farmland has been on the decline since the days of the depression. A recent indicator of this trend is shown by Table XIX. Over a nine year period, between 1978 and 1987, the county lost nearly 20,000 acres of farmland. This was accompanied by a seven percent decline in the number of farms and a 19 percent reduction in the average size of farms. Also, the number of farmers engaged principally in farming declined by 13 percent.

The dominant use of farmland is in forest acreage, in spite of a 37 percent decline between 1978 and 1987. Pasture land, both cultivated and wooded, comprises the second major use of farmland. Only nine percent of the land in farms is devoted to harvested crops, while 16 percent is in other uses.

Neither agricultural land use nor production commands a prominent position in Fairfield County. In comparison with other counties in the state, it ranks no higher than 41st in farmland acreage or market value or products sold, while ranking 18th in total area.

#### Urban and/or Developed Land Use

Estimates from Table XVIII show the amount of urban and/or developed land to be approximately 7,350 acres, based on population concentrations of 10 or more acres. These measurements were computed by the Soil Conservation Service from detailed Soil Surveys, using a 10-acre grid system. Development of less than 10 acres was not computed.

A second estimate employing "per capita land usage ratios", establishes the number of acres in urban or developed land at about 6,900. This estimate is based on a ratio of 0.308 acres per person (22,295), derived from comparable land use studies. It tends to validate the estimates generated by the Soil Conservation Service, suggesting a range between the two.

Urban or developed land consists principally of four broad based land use categories: residential, commercial, industrial and service (public and/or private), i.e. religious, medical, governmental, utilities, transportation, etc. A description of their location and specific characteristics within Fairfield County follows.

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#### TABLE XIX.

					Chan 1978-1	ge 1992
	<u>1978</u>	<u>1982</u>	<u>1987</u>	<u>1992</u>	<u>No,</u>	वर्ग
Land In Farms (Acres)	76,794	62,427	57,293	55,712	-21,082	-27
Farms (number)	201	212	186	189	-12	-06
Average Size of Farm	382	295	308	295	-87	-23
Farming Principal Occupation of Farm Operator	76	82	66	69	- 7	- -09
Total Cropland (acres)	22,621	18,539	19,360	17,198	-5,413	-24
Harvested Croplan	nd 5,658	5,358	5,154	5,848	+ 190	03
Source: U.S. Dep	artment of	Commerce.	Bureau of Cei	nsus. 1987.C	ensus of	

# FARMS, LAND IN FARMS AND CROPLANDS 1978-1992

Source: U.S. Department of Commerce, Bureau of Census, <u>1987 Census of</u> <u>Agriculture</u>, Vol. 1.



# General observations reveal:

- Scattered development with concentrations around the seat of county government (Winnsboro) and smaller community clusters, i.e. Ridgeway, Mitford, Jenkinsville.
- Expanses of undeveloped, wood and farm lands.
- Relatively intense development along the Winnsboro By-pass.
- \* General mixing of development in the unincorporated and unregulated municipal fringe, south of Winnsboro.
- Weak design and construction of most county maintained and farm-to-market roads.
- An influx of alternative low-cost housing in the form of mobile homes.
- Scattered pockets of substandard housing and living conditions.
- \* An historical presence.
- \* Underdeveloped resources.
- \* Rural charm.
- \* Concentrated development along the shores of Lake Wateree.
- \* Resource and unfulfilled development potential of the Monticello Reservoir.
- Vital linkage and enhanced accessibility provided by I-77; and
- \* A bustling industrial complex south of Winnsboro.

# Residential Land Use

As mentioned previously, the dominant form of residential use is conventionally built, single-family detached housing. But mobile homes and other manufactured structures are rapidly adding to the county's housing stock. Even multi-family housing is now available in the fringe areas of Winnsboro, where municipal infrastructure is available. Residential development is found in both isolated and cluster patterns along most county roads. The largest concentrations are located:

- (1) South of Winnsboro and to a lesser extent in other fringe areas around the county seat,
- (2) Along the shores of Lake Wateree, and
- (3) The Mitford community.

Other areas of lesser concentrations include the unincorporated area around Ridgeway, particularly along U.S. 21 into Richland County, the Jenkinsville community, and a few clusters around the Monticello Reservoir. Elsewhere, residential development is characteristically sparse and rural in response to the county's agricultural past.

#### Commercial Land Use

Traditionally commerce has been the hub of development, occupying the center position. With suburbanization and sprawl, commercial development has followed suit, relocating from the center to more convenient outside service areas. And with improved transportation facilities opening other areas to development, i.e. by-pass routes, controlled access and interstate highways, commerce has gravitated toward such facilities.

Commerce still occupies the center of Winnsboro, but commercial development along the U.S. 321 By-pass and south of town has been impressive in recent years, challenging the dominant core position of the town's Central Business District.

Highway-oriented commercial development, once relatively prominent along U.S. 21 and U.S. 321 has declined since the opening of I-77. But I-77 has yet to attract the commercial activity which is sure to materialize in time.

Like most predominantly rural counties, with scattered residential development, commercial uses beyond the Winnsboro area are found generally in singular locations, at intersections and along the more heavily traveled roads. These sitings allow for maximum visibility and convenience of access to a larger, but sparse geographic area. They are spotted throughout much of the county, with heavier concentrations in the more developed areas, i.e. Mitford, Jenkinsville, and south and west of Ridgeway.

# Industrial Land Use

Clearly, industrial and distribution facilities are the most dominant and notable uses of land in the unincorporated areas. Mack Trucks, Rite Aid, the JPM Company, Standard Products, Uniroyal, Carolina Apparel, the Manhatten Shirt Company, Hon Furniture, Copian Industries, etc. are all located in the unincorporated areas. As a general rule, industry, distribution and warehousing operations tend to locate in proximity to but beyond corporate municipal areas. Such is the case in Fairfield County, where the vast majority of such operations are located.

Recent industrial trends show significant development in the areas south and southeast of Winnsboro, as reflected by the existing land use map.

#### Service Land Use

Service land uses are scattered throughout the county. They include churches, schools, utilities, governmental buildings and facilities, parks, etc.

#### Ramifications

Existing land use patterns account for a number of common land use problems, such as incompatible mixed land usage, neighborhood instability, traffic congestion, and strip commercial development.

Mixed land usage and the associated problems of land use incompatibility are found to the north and south of Winnsboro. Much of this is due to the transitional process of older homes giving way to commercial enterprises and other uses. Residential uses are not sufficiently insulated and protected from the negative impact of change occurring around them.

Residential stability is constantly under siege in unprotected transitional areas, such as those south of Winnsboro. Lower intensity uses, i.e. single-family dwellings are pressured for higher intensity development.

Land use intensity, curb cuts, and street alignments have a profound influence on traffic conditions. And there are examples around Winnsboro where improper alignments, excessive or expansive curb cuts, and high intensity development have contributed to traffic congestion and safety hazards.

Strip commercial development is evident and is intensifying along the By-pass. Such development affects not only the movement and safety of traffic, but challenges the purpose of the By-pass, which is to expedite the movement of traffic around the congested center of town. If volumes and congestion along the By-pass reach or surpass those on the original route through Winnsboro, the objective is partially compromised. This is not to say that the By-pass has not served a useful purpose, particularly as a "development highway", but that it is increasingly less effective in moving traffic around Winnsboro--the original intent for which it was constructed.

#### INFRASTRUCTURE

Adequate infrastructure is fundamental to urban and economic development. Although the degree of infrastructure dependence will vary according to the requirements of a use, the status of the following could well determine the development feasibility or potential for any given area of the county.

> Transportation facilities Water supplies Sanitary sewer service Electrical power Natural gas Fire protection

## Transportation Facilities

Urban development in general and economic development in particular are influenced perhaps more by transportation facilities than any other single element.

The principal means of transportation in Fairfield County is, of course, by roadways, augmented by rail and air systems. The majority of the road system is maintained by the State of The capacity of these roads to serve existing South Carolina. and projected development is critical to the planning process. In evaluating that capacity, the South Carolina Department of Transportation categorizes all roadways using a level of service This defines roads in terms of their service (LOS) concept. characteristics, ranging in levels from A to F. An "A" level of service roadway has free flow conditions with relatively low volumes and little or no delays. The other end of the spectrum an "F" LOS with stop and go operation and average signal is delays greater than one minute. Table XX characterizes and defines the various levels of service.

All roadways in Fairfield County are designed to provide a minimum "C" level of service. Where traffic exceeds this designed level of service, improvements are then generally scheduled by the State. Typically, roadways with an LOS of D, E or F will be given top priority for improvements. Based on the absence of any major planned improvements by the Department of Highways and Public Transportation for Fairfield County during the next 10 years, it may be assumed that all roadways are operating at or below Level C, and that none is projected to exceed Level C before the year 2000, at the earliest.

# TABLE XX

# ROADWAY LEVELS OF SERVICE DESCRIPTIONS

# Level of Service A

- \* Free flow conditions
- \* Low volumes
- \* High operating speeds
- \* Uninterrupted flow
- \* No restriction on maneuverability
- \* Drivers maintain desired speed
- \* Little or no delays

#### Level of Service B

- \* Stable flow conditions
- Operating speeds
  beginning to be
  restricted

Level of Service C

- Stable flow but speed and maneuverability restricted by higher traffic volumes
- \* Satisfactory operating speed for urban conditions
- \* Some delays at signals

Level of Service D

- High density, but stable flow
- \* Restricted speeds
- Noticeable delays . at signals
- \* Little freedom to maneuver

Level of Service E

- Low, but relatively uniform operating speeds
- Volumes at or near capacity
- \* Approaching unacceptable delays at signals

Level of Service F

- \* Forced flow conditions
- \* Stop and go operation
- Volumes below capacity, may be zero
- Average vehicle delay at signals is greater than one minute

# TABLE · XXI

# TRAFFIC VOLUMES SELECTED ROADS IN FAIRFIELD COUNTY 1981 - 1990

			Change	3
	<u>1981</u>	<u>1990</u>	No.	<u>%</u>
I-77	4,700	20,800	16,100	3.43
SC 34, between 1-77 & Winnsboro Ridgeway and	3,500	4,965	1,465	0.42
Kershaw County	950	2,233	1,283	1.35
Winnsboro and Little River	1,700	1,829	129	0.08
U.S. 321 South of Winnsboro North of Winnsboro By-Pass	4,800 4,000 5,900	3,694 2,606 6,258	-1,104 -1,394 358	-0.23 -0.35 0.06
U.S. 21, between Ridger and Chester Co. Line	way 6,500	1,085	-5,415	-0.83
Old River Road, between U.S. 21 & I-77 I-77 and SC 200	n 425 750	611 1,205	186 455	0.44 0.61
River Road at State Park Bridge	110	437	327	2.97
S.C. 215 Monticello Reservoir Chester County Line Monticello Reservoir	to 900	1,081	181	0.20
Richland County Lin	e 1,100	1,119	19	0.02

Source: S. C. Department of Highways & Public Transportation, Traffic Volume Maps, Selected Years. Still, all major roadways should be monitored for change, based on traffic volume increases recorded on selected roadways during the 80s (Table XXI). Traffic on I-77 increased by nearly 350 percent between 1981 and 1990. Much of the increase was due to shifting traffic from parallel roadways, U.S. 321 and U.S. 21, where traffic decreases were recorded.

Other, more internal oriented routes also recorded increases, but none as large as those on I-77. S. C. 34 recorded a significant increase between Winnsboro and I-77, and between Ridgeway and Lake Wateree, but only a slight upward move west of Winnsboro.

Traffic on Old River Road increased as a result of interstate accessibility, along with traffic along River Road, due to increased building on Lake Wateree. West of Winnsboro, traffic volume changes were minor by comparison.

From the traffic volume data recorded during the last decade (1981-90), it is obvious that most development activity is taking place south and east of Winnsboro, with few changes occurring to the north and west. And future traffic volume changes on the major roadways in these areas should be carefully monitored to protect their carrying capacity for projected growth and development.

## Water Supplies

There are five public water systems in the county serving approximately 51 percent of the population. Additionally, less than two percent receive water from private residential systems. The balance relies on individual wells.

The five public providers are (1) the Town of Winnsboro, (2) the Town of Ridgeway, (3) the Jenkinsville Water District, (4) the Mid-County Water District, and (5) the Mitford Water District. Of the five public providers, only the Town of Winnsboro draws from a surface supply. The source is from a reservoir in the Jackson Mill Creek watershed, west of Winnsboro.

The reservoir contains about 600 million gallons of water, of which approximately one million gallons per day are consumed. The Town's treatment plant has the capacity to process about two MGD, with about 50 percent excess capacity for growth and new development at this time.

The other four public systems draw from groundwater sources, which have a relatively low yield in Fairfield County. Still, each of the systems is currently operating below capacity, with room for additional growth and development, albeit minimal by comparison with Winnsboro's surface water supply. There are five private water systems in the county: two serve mobile home parks, two serve nursing homes and one serves a subdivision. Each is relatively small in terms of persons served. There are also two industrial water systems and nine miscellaneous systems serving outlying parks, schools, landings, camps, etc.

The current status of major line implacements and the extent of coverage in the county are shown by the accompanying Water Service Area Map. As may be seen, all intensely developed areas are accessible to a community system.

# Sanitary Sewer Service

Community or public sewer systems are not nearly as extensive in the unincorporated areas as are community water systems. They seldom are. Service is confined to three areas--the Towns of Winnsboro and Ridgeway, with only limited extensions into nearby unincorporated areas, and in the upper part of the county, from the town of Great Falls, in neighboring Chester County, out S.C. 200 to I-77.

Suffice it to say, these areas have the jump on the balance of the county in terms of securing and accommodating higher intensity development. Urban development generally is contingent on sanitary sewerage facilities. Thus, much of the future development in the county may be expected to occur in these three areas, barring the construction of additional treatment facilities.

#### Electrical Power

The availability of electrical power sufficient to meet the needs of development, particularly industrial development, is a given in the site selection process. And electrical power in adequate supply for future development appears assured, with SCE&G's nuclear power plant located in the county.

But not all of the county is served by SCE&G. In fact, there are four electrical providers or distributors in the county:

> SCE&G Fairfield County Electric Cooperative Town of Winnsboro Newberry Electric Cooperative

The service areas of each are shown by the accompanying map. Interestingly, the areas with the greatest development potential have not been assigned to any one agency by the South Carolina Public Service Commission. As a result, the competition for customers often leads to confusion and duplicity.




## Natural Gas

Natural gas is supplied to the county by the South Carolina Pipe Line Company serving Richtex and SCANA's Summer Power Plant, west of S.C. 215. The pipeline company also wholesales gas to the Town of Winnsboro which retails and distributes it along U.S. 321 south and west of Winnsboro, and within the Winnsboro area. The town is also in a position to extend natural gas to other areas of the county in support of development, as economically feasible.

While not essential to all industrial operations, the availability of natural gas is a definite plus when recruiting industrial prospects and promoting economic development.

#### Fire Protection

The availability and level of fire protection has a direct bearing on the security of life and property, and the cost of insurance premiums. As such, it is a matter of considerable concern where development is contemplated, especially multimillion dollar industrial and/or commercial investments.

Fire protection in Fairfield County is provided by the public safety department of the Town of Winnsboro and ten stations operated as part of the county fire service. The county fire departments are funded directly by Fairfield County in its operating budget, out of the proceeds of a 3.1 mill fire tax. The Winnsboro Public Safety Department is funded from the budget of the town, supplemented by fire protection contracts. Some of the individual fire departments in the county are engaged in separate fund raising activities, but most of their apparatus and buildings are owned, and their operating expenses paid by the county.

The 10 stations in the county system are:

Community Greenbrier Southeast Dutchman's Creek Ridgeway Jenkinsville Mitford Lebanon Blair Feasterville

All of the departments except Winnsboro, Community, Ridgeway, and Mitford are rated Class Nine. The district covered by the Winnsboro Fire Department is rated Class Five, although some properties located beyond 1,000 feet of a fire hydrant carry a lower Class Nine rating. Community also has a split 5-9 rating. Ridgeway and Mitford have split 8-9 ratings. Other areas of the county, located beyond five miles of an existing station are protected to the extent possible under the current system, but are rated Class 10 for purposes of writing insurance, and charged accordingly as "unprotected areas".

In a recently completed <u>Fire Protection Master Plan</u>, by Eckman Associates, four additional stations are recommended to cover about 60 percent of the unprotected properties in the county. Their locations are:

> Rt. 321 at Woodward  $\nu$ Rt. 321 north of Winnsboro Rt. 34 at Salem Crossroads Rt. 321 at Rt. 30

Already, the county has allocated funding for the first of these stations in the Woodward Area. The proposed stations, together with the location and service areas of existing stations are shown by the accompanying map.



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## SECTION IV

### LAND USE FORECAST

Forecasting the need for and location of land for future development is one of the principal objectives of any land use plan. But, there are no exact standards by which to measure this need. The amount of land required to support the population of a big city, for example, is considerably less per person than the average amount consumed in Fairfield County. It is a matter principally of land availability and economics.

One fairly reliable method for use in determining future land use needs in the county is to relate <u>land use</u> to <u>population</u>. Over the years, our firm has compiled land use and population data from over 30 local surveys. We have found the average consumption of land in unincorporated areas to be approximately .34 acres per person, allocated among the four basic land use classifications as follows:

## Table XXIII

Land Use <u>Classification</u>	Land Use Requirements <u>(acres per person)</u>	Percent of <u>Development</u>		
Residential Commercial Industrial Service	.21 .01 .08 .04	62.0 3.0 24.0 11.0		
TOTAL	.34	100.0		

Source: Vismor & Associates, Inc.

Using these allocations for Fairfield County we estimate that about 512 additional acres will be developed by the year 2000, and an additional 340 acres by the year 2010. Not all of it will come from the rural register, of course. There will be some in-filling of existing subdivisions and development in built-up areas around Winnsboro, effectively reducing the need for raw undeveloped land. Still, the impact will be measurable.

Residential use should comprise approximately 62 percent of all new development, accounting for approximately 430 additional acres by the year 2010.

## Table XXIV

### Land Use Forecast, By Use

	2000	2010
Population (additional)	1,505	1,000
Land Use (additional acres)		
Residential Commercial Industrial Service	320 15 120 57	210 10 82 38
Total (acres)	512	340

Source: <u>Ibid.</u>

Future industrial land use is perhaps the most difficult to estimate with any degree of accuracy, due to a multitude of factors, not the least of which is the county's ability to secure and accommodate new industry.

Fourteen potential sites have been identified by the South Carolina State Development Board ranging in size from 13 to 3,500 acres. However, most are without basic infrastructure, i.e. water and sewer. Only 42 percent of the sites have water and 36 percent have sewer. But these sites have in combination 772 acres with water and 760 with water and sewer, representing far more land than is forecast for industrial development during the life of this Plan. But who is in a position to know how successful the county will be in its quest for new industry?

Suffice it to say, most future industrial development will occur in the unincorporated areas, due to the added overhead (taxes) of a municipal location. And those sites listed by the State, particularily those between Winnsboro and Ridgeway, appear most likely to appeal to new industry. It is important therefore, to set aside some of these areas, and protect them for future industrial use, to the extent practical and feasible---to plan for industrial development in those areas best suited to such operations.

Because of the dependency of commercial uses on residential areas and high volume streets and highways, we may expect to see future commercial development follow the lead of residential movement. Likely, it will occur in the form of small convenience establishments in expanding suburban areas, and become more

intense in areas outside of Winnsboro, and at I-77 interchange locations.

The amount of service land needed through time, again, is directly related to the amount of land used principally for residential purposes. The need in the county is projected to be only 95 additional acres by the year 2010. This includes social, medical, recreational, governmental, religious, and related uses. Many of these uses will continue to be found in the county's two municipalities, thus minimizing their impact in the unincorporated areas.

### SECTION V

### PLANNING ISSUES AND OBJECTIVES

### CITIZEN PARTICIPATION IN THE IDENTIFICATION OF ISSUES AND NEEDS

One of the principal objectives of this program is to provide ample opportunity for citizen participation in the planning process---to allow the public to help identify issues and problems that should be addressed by the Plan. Toward this end, the Planning Commission conducted three public "in-put" meetings in various parts of the county. The meetings were held in Ridgeway, Monticello and Winnsboro. Additionally, a select group of students and teachers were surveyed in the same manner to determine their concerns for the future, and how this planning program should address them.

The format consisted of a presentation by the Commission and its consultant-staff. The presentation consisted of factual background data on trends and conditions within the county, followed by population and development forecast for the various geographic areas. Constraints to and capabilities of development were outlined, and preliminary issues identified.

Having briefed or primed the audience, the agenda then focused on citizen participation. To aid in the process, a survey questionnaire was used to guide the discussion. The questionnaire enlisted participation in the identification of community needs and issues, and solicited guidance in charting a course of action to be taken by the Planning Commission and County Council in addressing such needs and issues.

A total of 121 persons participated in the process. While the number is relatively small, and their views may not be considered a mandate, clearly they represent a "good indication" of what needs to be done to improve and enhance the development process through planning and subsequent implementing activities.

As issues, needs and problems tend to vary from area to area, the questionnaire focused on (1) area identification of the respondent and (2) needs within such area. The areas divided generally along the following lines:

#### <u>Area</u>

### Description

1

East of Winnsboro, including Lake Wateree, Simpson, Rockton and Ridgeway.

- <u>Winnsboro and South of Winnsboro</u>, including Forest Hills, Bethel and areas surrounding Winnsboro.
- 3

2

<u>North and West of Winnsboro</u>, including Mitford, White Oak, Blackstock, Blair, Monticello and Lebanon.

In descending order, the following were identified on the basis of "urgency of need" for each area.

<u>Area #1</u>	<u>Area #2</u>	<u>Area #3</u>
Street improvements	Street improvements	Street improvements
Public Sewer	Housing Improvements	Public Sewer

Land Use Regulations Land Use Land Use Regulations Regulations Regulations

Several other needs also were identified by a smaller margin of concensus, including the need to improve street lighting in some areas, the need for drainage improvements, the need to address unkept property, junk yards, litter control and animal control. Also, the need to install sidewalks in certain areas was suggested as well as the need to address hazardous industry.

When asked if they thought the county (Council) has a responsibility for improving and/or addressing any of these needs, 77 percent said YES. They want the county to get more involved in these matters, particularly in the areas of land use, housing, pollution control, road maintenance, erosion control and property maintenance.

With regard to specific planning and development issues which should be addressed by this Plan and subsequent implementing programs, citizens at the public in-put meetings were asked to comment on the "needs list" in Table XXV. By a substantial majority, ranging from 60 to 87 percent, those persons attending the meetings favored regulating the development process and protecting the county's amenities and environmental resources from misuse.

Issues on which over 80 percent of the respondents expressed concern and a need to regulate are:

- (1) Residential protection
- (2) Regulate development on major streets and roads
- (3) Certain land uses which could negatively impact the county, i.e. landfills, hazardous waste

## TABLE XXV

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# CITIZEN'S RESPONSES TO PLANNING AND DEVELOPMENT ISSUES AND NEEDS

NEED TO:	YES	NO	NOT SURE
(1) Protect existing neighborhoods, subdivisions and homes from incompatible development?	.87	.08	.05
(2) Protect "prime" farmland?	.74	.12	.14
(3) Regulate development around Lake Monticello and Lake Wateree?	.67	.08	.24
(4) Guide the location and regulate the siting of mobile homes and mobile home parks in the county?	.63	. 23	.14
(5) Regulate the location of billboards and outdoor advertising signs?	.66	.12	.22
(6) Regulate development along major streets and roads to ensure safety, and movement of traffic along existing and proposed highways?	.80	.07	.12
(7) Identify and protect for future industrial development, sites with industrial potential?	.60	.07	.31
(8) Require landscaping as part of any new large scale industrial or commercial use?	.69	.13	.17
(9) Adopt guidelines for the location and development of certain land uses which could have a negative impact on the county, such as landfills, bazardous waste dump sites, race tracks, mining			
operations, nuclear plants, etc.?	.81	.04	.14
10) Regulate the impact of development on the county's natural resources and environmental amenities?	.74	.05	.21
•			

Source: Responses from 121 persons at three public hearings conducted by the Fairfield County Planning Commission and a select group of students and teachers. Responses expressed by percentage of participants.

dump sites, race tracks, mining operations, nuclear plants, etc.

In the area of infrastructure, resident participants at the three input forums generally were not supportative of additional park facilities or the installation and expansion of water and sewerage systems. However, the students and teachers who were surveyed were in disagreement on the issue of recreation and expressed a need for additional facilities as well as improved maintenance at existing facilities.

### Table XVI

Citizens Responses To Infrastructure Needs

NEED	FOR:	Additional Recreation <u>Facilities</u>	Community Water System	Community <u>Sewerage System</u>	•
AREA	1.	. 67	.46		:.
AREA	2	.61	.35	.16	
AREA	3	.58	.38	.19	

Note: Percent respondents indicating a need for such facilities.

The following additional facilities were suggested by the resident survey:

- (1) Facilities for youth and seniors
- (2) Hunting and fishing
- (3) Camping
- (4) Trails and picnic areas
- (5) Golf course
- (6) Community center
- (7) Ballfields
- (8) Tennis courts
- (9) Swimming pool
- (10) Skating rink

The following areas were identified as needing additional recreational facilities:

- (1) Northwest of Winnsboro
- (2) Southeast of Ridgeway
- (3) Simpson
- (4) Greenbriar
- (5) Longtown
- (6) Blair
- (7) Jenkinsville

(8) Blackstock

(9) Mitford

(10) White Oak

(11) Lebanon

## SUMMARY LISTING

From the citizens in-put meetings and the data compiled by this study, we are able to identify a number of broader based issues which should be addressed by this Plan. Development related for the most part, they focus on the impact and siting of new and expanded development, as follows:

- (1) Growth
- (2) Quality Development
- (3) Economic Development
- (4) Aesthetics
- (5) Transportation
- (6) Housing
- (7) Infrastructure
- (8) Resource Preservation
- (9) Recreation

## AMPLIFICATION OF ISSUES, OBJECTIVES AND RECOMMENDED RESPONSES

Each of the above broad-based issues is amplified in this section. Here specific objectives are established and appropriate responses to implementation recommended, as follows.

#### ISSUE: <u>GROWTH</u>

## OBJECTIVE: <u>TO ACCOMMODATE PROJECTED GROWTH IN AN ORDERLY</u> <u>MANNER, AND TO AMELIORATE ITS IMPACT ON</u> <u>EXISTING LAND USES AND ENVIRONMENTAL RESOURCES</u>

**RESPONSE:** 

This is a fundamental planning issue. At the core is the approach to be taken by the Planning Commission and County Council. It may opt to continue with its current "hands off" policy, relying principally on developers and market conditions to shape the future of the county, or it may adopt planning policies and land use controls to help guide the development process.

Clearly, the county will have little say in the process, this plan notwithstanding, if it fails to take a stronger position on development issues. But how should the county plan for future development? It should start by building a Plan that recognizes market and economic influences, and channel development accordingly, in an orderly fashion---enhancing rather than compromising environmental and living conditions.

Trying to plan where within the county certain types of development should occur can be difficult. However, for a continued established residential starter, in-filling of subdivisions and partially developed areas should be encouraged. It makes sense economically, especially where roads, water and sewer lines, etc. are in place. A policy to encourage in-filling also represents a positive response to the conservation of prime farmland and other natural resources. still, much of the anticipated growth will be in the form of new housing complexes, expanded subdivisions, and scattered housing. Also, new industrial and commercial development is expected. Where?

Movement is expected to follow in the directions indicated by Map X. And, these areas should be readied for development, with plans for facilities and controls.

Contrary to popular belief in many unregulated areas, growth and development, per se, do not necessarily equate to prosperity or community enhancement. Improper development may adversely impact existing land use and environmental resources. To ensure against such occurrences, the county should consider for adoption standards and regulations to address the following:

a. <u>Buffering Between Potentially Incompatible Uses</u>

Buffering is a proven means of ameliorating differences between uses. Noted architect Frank Lloyd Wright succinctly captured the essence of buffers when he observed that "greenery hides a multitude of sins". Buffers are intended to screen or block vision, noise pollutants, or other by-products which might negatively impact existing development. Simply put, they offer a means of protecting existing uses from any negative impacts of new development and, as such, are recommended for orderly development.

## b. Building Heights

The maximum height to which buildings and structures may be erected seldom is considered to be a problem, particularly in unincorporated areas where high-rise development is not likely to occur. However, if and when confronted by a project considered to be out of scale, it will be too late to remedy the situation without land use controls. Suffice it to say, high-rise structures can adversely affect existing development, particularly low-rise, singlefamily residential uses. Yet, too little attention generally has been given this particular issue.

## c. Building Setbacks and Curb Cuts

Setback and curb cut regulations can help limit future spending on highway widening projects, prevent encroachment by neighboring uses, and reduce the hazard of turning maneuvers on major streets and highways.

d. <u>Performance and Siting Standards for Manufacturing</u> <u>Uses</u>

Performance standards can protect against air and noise pollution, vibration, fumes, odor, glare, and other negative by-products of some manufacturing and related uses.

They can also check or substantially modify the location and operation of potentially incompatible uses such as dump sites, salvage yards, hazardous waste facilities, etc.

## e. Erosion and Sediment Control

Erosion is a problem in parts of Fairfield County, due to its rolling terrain. And it is often compounded by development, where proper preventive measures are not employed during and after construction. Where there is erosion there is also a problem with sedimentation, drainage and water pollution. Drainage and storm water run off are addressed by the county's Subdivision Ordinance, but the issue of erosion as a negative by-product of the development process remains unaddressed. To remedy the situation, the county should enact legislation prescribing "best management practices" where earth disturbing development is taking place.

### ISSUE: <u>OUALITY DEVELOPMENT</u>

#### OBJECTIVE: <u>TO FOSTER QUALITY DEVELOPMENT</u>

#### **RESPONSE:**

That projected growth will generate new and expanded development is certain. What is not so certain is the quality of that development.

It is not enough to want quality development. In order to make it happen, the county should:

a. Regulate the Use of Land

Use requirements are rudimentary to the protection of land values and the promotion of quality development. They can prevent the "junk yard" from locating next to or across the street from a quality residential area, thus assuring land use compatibility, stable land values, and the promotion of "land use compatibility".

- b. <u>Enact Landscaping Requirements</u>, for all nonresidential and multi-family projects. They will add greatly to the aesthetic qualities of such projects.
- c. <u>Enact Open Space Requirements</u>, for all multifamily and attached single-family projects. They will establish a proper relationship between high-density housing and needed open space, adding greatly to the quality of such housing. The county has such requirements for mobile home parks, but not multi-family housing projects.

#### ISSUE: <u>ECONOMIC DEVELOPMENT</u>

OBJECTIVE: <u>TO STIMULATE AND ACCELERATE ECONOMIC</u> DEVELOPMENT

#### **RESPONSE:**

This issue is critical to the continued growth and prosperity of the county. Toward this end, the following sub-goals are recommended:

- a. To more aggressively seek industrial and business development with the appointment of a professional coordinator.
- b. To build upon the existing base of business and industry by using current assets to attract industries that complement these assets.
- c. To increase the number of new firms at an annual average of three per year.
- d. To maintain or increase the current percentage of the work force in manufacturing jobs.

- e. To identify and protect industrially suited sites for future industrial development.
- f. To create a more favorable environment for existing industry by protecting them from encroachment by potentially incompatible uses.
- g. To develop a high profile industrial park.
- h. To support and develop a strong agri-business environment, including forestry, farming, housing, etc.
- i. To aggressively pursue the development of programs designed to attract "retirees" to Fairfield County.

Currently, the State Development Board and the Economic Development Council of the Midlands represent the county in its efforts to secure new economic development. But more in the way of a county economic development office may be needed. And, indeed, such a move is being considered by County Council.

Additionally, the county should move to create a more favorable industrial climate by protecting potential industrial sites, as well as existing industry.

There are several industrially developing areas south of Winnsboro and along the S.C. 34 corridor between Winnsboro and I-77. Also, some 14 potential sites with approximately 3,500 acres have been listed with the South Carolina State Development Board for industrial development. And the county is considering the development of an industrial park on I-77, between S.C. 34 and Peach Road.

But unless these sites are secured through options or acquisition they may not be available if and when needed for industrial development. And the loss of good industrial sites could compromise the county's ability to secure much needed industry. It is simply not feasible however for the county to purchase and facilitate all properties with industrial potential, or wise to focus its attention solely on the development of one industrial park, although such a facility is needed. Through its regulatory power, the county can protect at no additional cost, those properties judged best suited to industry. Also the county can help maintain an industrial environment for its existing industries by, again, calling on its regulatory power to preclude encroachment by residential and other incompatible uses.

The county may enact land use regulations to protect industrially suited sites exclusively for manufacturing and related uses. Such a measure is strongly suggested by this

Plan. Being prepared with sites and facilities is half the battle. The other half is recruiting and job training. And, while there is help from the state and Economic Development Council of the Midlands with recruiting and job training, the primary responsibility for securing sites and creating an environment favorable to industry rests with local officials.

### ISSUE: <u>AESTHETICS</u>

## OBJECTIVE: <u>TO PRESENT AND MAINTAIN AN AESTHETICALLY</u> <u>PLEASING ENVIRONMENT</u>

### **RESPONSE:**

Salvage yards, billboard clutter and "junky" development can contribute to aesthetic pollution. There are examples of such pollution in the county. Yet, there is nothing the county can do at this time to address or improve the situation.

The Sierra Club has identified South Carolina as a state in which outdoor signs and billboards have been allowed to clutter and blight the environment. While such abuses are not yet visible along I-77 in Fairfield County, it is simply a matter of time, particularly along I-77, unless measures are taken to regulate such uses. With increased traffic, increased usage of billboards may be expected. While there is nothing inherently wrong with billboards, they can pollute the environment if not properly sited, sized and located with respect to their surroundings. And there are some areas where they may be completely out of character. But without development regulations the county is powerless to do anything about billboards.

Also, aesthetic regulations would be helpful in screening salvage yards and other unsightly uses. The enactment of an "Existing Building Code" and "Standard Housing Code" would help clean up some of the blighted structural conditions in the county, and go a long way toward making Fairfield a cleaner more aesthetically pleasing place in which to live.

### ISSUE: TRANSPORTATION

## OBJECTIVE: <u>TO IMPROVE ACCESS TO I-77 AND PROMOTE</u> <u>HIGHWAY SAFETY ON EXISTING AND PROPOSED</u> <u>STREETS AND ROADS</u>

#### **RESPONSE:**

With so little attention paid to land use and its impact on the transportation network, it is little wonder that the "designed carrying capacity" and safety of most roads are compromised over time. To guard against this happening on the roads and highways in Fairfield County, consideration should be given to the adoption of curb cut and setback controls.

Setbacks will reduce the hazards to driving and permit future street widening at the most economical scale.

Curb cut controls can be especially effective in reducing the hazards of turning maneuvers, and maintaining highway use efficiency.

More importantly from an economic development standpoint is to better access I-77. The SHIMS Plans (Strategic Highway Plan For Improving Mobility and Safety) is designed to promote economic development by supplementing the interstate system with an integrated network of four-lane roads and highways. Yet no such improvements are proposed by the Plan for Fairfield County.

Clearly, S.C. 34 should be considered for inclusion in the SHIMS Plan as well as an additional access interchange and frontage road at the Peach Road crossing of I-77, in the southeastern part of of the county. These improvements would greatly enhance the economic development potential of the county, as advocated by the SHIMS Plan.

### ISSUE: <u>HOUSING</u>

**OBJECTIVE:** 

### TO MAKE DECENT HOUSING AND LIVING CONDITIONS AVAILABLE TO ALL RESIDENTS OF FAIRFIELD COUNTY

**RESPONSE:** 

Housing trends and conditions discussed previously speak to the housing needs of low and moderate income families in Fairfield County. A strategy to meet these needs is outlined in the <u>Central Midlands Comprehensive Housing Affordability Strategy</u> (CHAS), 1991. Specific recommendations in the Plan call for:

a. Utilization of new federal housing programs included in the National Affordable Housing Act of 1990, i.e.:

> <u>Title II, Home Program</u>, providing matching grants for rehabilitation, new construction, site improvements, acquisition, tenant based rental assistance, financing cost and relocation benefits.

<u>Title III, Homeownership Incentives</u>, providing assistance to first-time home buyers by

establishing a National Homeownership Trust Fund.

<u>Title IV, HOPE Program</u>, providing homeownership and opportunity for people everywhere.

<u>Title VIII, Housing For Persons With Special</u> <u>Needs</u>, providing assistance to the elderly and persons with disabilities.

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Utilization of existing housing programs, i.e.:

Title V, Housing Assistance-Public, Section 8, and Foster Care Assistance

<u>Title VI, Preservation of Affordable Rental</u> <u>Housing</u> - Prepayment clauses on Section 236, 221(d)3 housing and other preservation provisions.

Title VII, Rural Housing

<u>Title VIII, Housing for Persons With Special</u> <u>Needs</u> - Section 202 and McKinney

Title XI, Community Development Block Grants

- c. Greater involvement by local governments, to include:
  - (1) Inventorying available land for housing development;
  - (2) Supporting the cost of land planning and engineering to reduce future improvement problems;
  - (3) Assembling land and clearing titles including lots lost to delinquent taxes and vacant improved lots for in-fill;
  - (4) Making housing packages available to private developers on a competitive basis; and
  - (5) Supporting the Building Materials Bank for recycling excess materials from construction sites.
- d. Greater involvement by the Central Midlands Regional Planning Council, the private sector and the banking industry.

#### ISSUE: <u>INFRASTRUCTURE</u>

## OBJECTIVE: <u>TO EXTEND WATER AND WASTEWATER SERVICE</u> <u>AND FACILITIES TO ACCOMMODATE PROJECTED</u> <u>GROWTH AND DEVELOPMENT</u>

## **RESPONSE:**

Growth of the county is contingent on the availability of water and sewer. And while prevailing low density patterns over much of it preclude countywide coverage, such facilities are essential to higher intensity development.

With the County Planning Commission responsible for land use planning, five different agents---Winnsboro, Ridgeway, Mitford Water District, Mid-County Water District and the Jenkinsville Water District---responsible for providing water, and three different agents responsible for providing sewer (Winnsboro, Ridgeway, and Great Falls) to the unincorporated areas of the county, the need for a close working relationship among these groups is obvious. One cannot properly function without the other. Cooperation and mutual support are essential to the orderly, planned development of the county, at the most efficient scale.

### ISSUE: RESOURCE PRESERVATION AND ENHANCEMENT

OBJECTIVE: <u>TO CONSERVE AND PROTECT THE COUNTY'S</u> NATURAL AND HISTORIC RESOURCES

**RESPONSE:** 

Due to the non-replenishable nature of the county's natural and historic resources, care should be exercised in their use and/or development.

Included among such uses and facilities in Fairfield County are the following:

- a. Prime farmlands
- b. Water resources; i.e. Lake Wateree, Monticello Reservoir, Winnsboro Reservoir, the Broad River, and smaller creeks and ponds.
- c. Historical buildings and places listed by Table XXVII.
- d. Woodlands.

The retention of <u>prime farmlands</u> for agricultural purposes should be encouraged and fostered to the extent practical and feasible. The county may help by legislating the use of such lands exclusively for agricultural and related purposes.

Conserving and <u>protecting water resources</u> may be accomplished in part through the enactment of development and use controls on adjoining property. Conservation easements along the Broad River, similar to those employed by SCE&G around the Monticello Reservoir would be helpful. Both should be pursued in an effort to control development along the banks of the county's water resources.

Preservation of designated landmarks, buildings and areas of historical significance must be viewed in the larger context of controlling development around and adjacent to such places. Toward this end, emphasis should be placed on the design of development controls to ensure land use compatibility. On the following page is an inventory and map showing the location of historical places in Fairfield County.

Obviously, the entire county will not be built-out by the year 2010. Nor is full development encouraged or desired. Considerable land acreage not essential to future development will remain undeveloped. But which lands?

This question is directed at the heart of planning. Land will remain undeveloped with or without planning, for the simple reason that the market cannot support full development within the time frame of this Plan. But without planning and land use regulations, there could be a loss of land resources, i.e. farmlands, river and creek vistas, hunting areas and an imbalance of development and needed open space.

The Plan should speak to the issue of conservation, and identify areas and resources better left undeveloped during the next 18 years. But it may need reinforcement from the county in the way of land use regulations in order to achieve implementation.

Also, measures should be taken to:

- a. Channel development into the more urbanized areas of the county where it can be better and more efficiently served with water, sewer, fire protection, etc.
- b. Discourage the extension of public facilities into the rural areas not projected for development, thereby limiting other than rural density development.



# TABLE XXVII

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TRACTIONI OF HISTORICHT LINCES	INVENTORY	OP	HISTORICAL	PLACES
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1.	Blink Bonnie	41.	Dr. Walter Brice House	81.	White Hall AME Church
2.	Longtown Baptist Cemetery	42.	Tom "Shanty" Brice Place	82.	Parr Shoals
3.	Bryant Hill Cemetery	43.	Stevenson Home	83.	Chappell Flace
4.	Longtown Prasbyterian Church	44.	Balwearie	R4.	Mavfair
5.	The Dixon House	45.	Albion	85.	Shiloh Methodist Church
6.	The Hunter House	45.	The Jane Turner Place	86.	Fair View
7.	St. Stephen's Episcopal Church	47.	Remains of Old Jackson Creek	87.	High Point
8.	Aimwell Presbyterían Church		Presbyterian Church	88.	Little River Baptist Church
9.	Ruff's Chapel	48.	The Did Manse	89.	Holley Place
10.	Longleaf	49.	Lebanon Presbyterian Church	90.	Ebenezer ARP Church
11.	Ruff and Company .	50.	W. K. Turner Home	91.	Kincald Manor-Heyward Hall
12.	The Century House	51.	Dr. Hardy Liston Birthplace	92.	Anderson Quarty
13.	Ridgeway Baptist Church	52.	Martin Place	43	Union Memorial Presbyterian Church
14.	Hount Hope	53.	Lemmon Place	94	Achford House
	Cedar Tree	54.	The Bell Place	as.	And Horeb Presbyterian Church Site
Y.	Vaughan House	55.	Happy Valley	96.	Site of Mason's Meeting House
	Valencia	56.	Salem Presbyterian Church	97	Trapp Home
18.	Cason Family Cemetery	57.	Site of Hans Hayner Port	98.	Crooked Run Baptist Church
19.	Durham House	58,	Old Feaster Comutery	99.	Bathel Methodist Church
20.	Boulware Walls Burying Ground	59.	Liberty Universalist Church	100.	Thomas C. Canak Bone
21.	Rocky Mount Battle Marker	69.	Feasterville female and Male Academy	101.	Brown-Rexrode House
22.	Johnston Home	61.	The Robert W. Coleman liouse	107	Hauthorne-Brown House
23.	Rocky Creek Canal	62.	Clanbore	101.	Warren Castles House
24.	Deputary Creek	0J.	Shelton	104.	Old Furman Building
25.	Bethesda Methodist Church	<b>64.</b>	Cool Branch Baptist Church	105.	Pairfield Baptist Church
26.	Mt. Zion Baptist Church	65.	Beaver Creek Baptist Church	106.	The Oaks
27.	Caldwell House, Mitford Community	66.	Coleman Cametery	107.	The Bob Leinson Place
28.	Grafton House	67.	Old Yongue Burying Ground	108.	Kelly Miller School
29.	Covenanter Cemetery	68.	Later Yongue Cemetery	109.	Greenbrier Methodist Church
30.	Covenanter Marker	69. To	Mobley Meeting House	110.	William Estes Home
31.	Camp Welfare	70.	Means Camatery	111.	Thomas Nightingale's Cowpen
32.	Mt. Olivet Presbyterian Church	71.	Lyles-Feaster Home	112.	Site of Broome's Mill
33.	White Oak ARP Church	• 72.	IVY HALL	113.	Thomas Woodward, the Regulator
34.	Robert E. Patrick Home	73.	Long House	114.	Anvil Rock
35.	Galloway-Moore House	74,	Old Lyles Cemetery	115	Toraland
	Concord Presbyterian Church	75.	Rock Creek Baptist Church	116	
	M. T. Patrick Home	76.	Fonti Flora	119.	Dr. Drojej Jackson Sandara
	Lewis Place	77.	McCrorey-Liston School	11/.	pr. Pantel Guason Sanwels
, 39.	Calvin Brice Place	78.	Dawkins House	110.	Myrid House
40.	New Hope ABP Church	79.	Monticello Mathodist Church	120	Wieschere County Cest
		80.	Davis Plantation Home	120.	HTHHARATA' CARIEL ACAA



The loss of some open land resources may not be anything to be alarmed over, but the steady erosion of such land will jeopardize the county's legacy to future generations.

## ISSUE: <u>RECREATION</u>

## OBJECTIVE: <u>TO PROVIDE À COMPREHENSIVE AND BALANCED</u> <u>SYSTEM OF PARKS AND RECREATION FACILITIES</u>

#### **RESPONSE:**

Recreation facilities seldom influence development, but they do complement it. They are essential to a balanced social environment. And with growth will come demand for more parks and recreational facilities, although support for more parks appears to be only luke warm according to the citizen in-put forums.

Recreational facilities in Fairfield County are provided by federal, state, county, city and private sponsors.

The federal government owns and manages approximately 11,560 acres in the Sumter National Forest, located in the northwest corner of the county. This facility provides hiking, riding and wilderness experiences, concentrating on recreational activities that require a lot of land.

The state owns and operates a large facility on Lake Wateree (Lake Wateree State Park). It includes a multitude of open space and water-oriented activities and facilities.

The Town of Winnsboro has a comprehensive recreation program, with two in-town parks, one of which (Fortunes) contains a swimming pool.

The Fairfield County Recreation Commission manages nine parks countywide, with a tenth being developed at this time. The location and assets at each are listed and shown by the following table and map.

Additionally, there is in the county a Recreation Association, with athletic facilities south of Winnsboro. Also, SCANA provides water-oriented recreation activities at its "Recreation Lake," north of Meadowlake Road, and fishing and boating on the Reservoir Lake.

Finally, the School Board makes it many facilities available for public use through the Fairfield County Recreation Commission.

## TABLE XXVIII

## RECREATION FACILITY INVENTORY (Including School Facilities)

Operator/Name	Map <u>Reference</u>	Acres	<u>Facilities</u>
<u>Federal</u>			
Sumter National Forest	1	11,560	Hiking, riding, outdoor experiences
State		•	
Lake Wateree State Park	2	72 .	Outdoor and water-oriented facilities, i.e. campground, picnic area, boat ramp
County			
Lake Monticello Park	3	25	Tennis courts, ballfield, basketball court, picnic facilities, fishing
Shelton Park	4	2	Basketball court and playground
Blaír Park	5	4	Basketball court, playground, picnic facilities
Adger Park	6	16	Basketball court, playground
Community Center	7	3.5	Multi-purpose gym, tennis courts, Commission Office
Rufus Belton Park	6	5.5	Ballfield, basketball court, playground, picnic shelters
Ridgeway-Centerville	9	14.5	Basketball court, tennis, picnic shelters
Blackstock Park	10	3	Ballfield
Unnamed Park	11	. 4	Being developedproposed ballfield
Garden Street Park	12	4	Ballfield, concession facilities
Municipal (Winnsboro)			
Fortunes Spring Park	13	9	Swimming pool, playground, picnic and jogging facilities
City Park	14	2	Basketball court, playground
Other			
SCANA Recreation Lake	15	NA	Skiing, fishing, swimming
Fairfield Recreation Associ Drawdy Park	ation 16	4	Ballfields (2)
Schools			
Fairfield Central High	17		Stadium, gym, practice field
Fairfield Middle School	1B		Gym, assembly grounds
Fairfield Primary School	19		Playground, 3/4 gym
Fairfield Intermediate	20		3/4 gym
McCrorey Liston Elem.	21		Gym, playground
Kelly Miller Elem.	22		Playground
Geiger Elem.	23		Playground
Gorden Early Childhood	24	÷	Playground
Richard Winn Academy (Private)	25		Gym, multi-purpose ballfield

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Source: Field Survey, Vismor & Associates, Inc.; Fairfield County Recreation Commission; Recommendations for Recreation, CMH Associates, 1987.



## SECTION VI

## COMPREHENSIVE DEVELOPMENT PLAN, 2010

In reviewing the various factors affecting development, i.e. projected growth, existing land use, economic conditions, development trends, and the other elements responsible for development, a skeletal framework begins to take shape. Forces already at work have provided us with a foundation. This Plan is designed to build on that foundation---not alter what has been done or start anew, but guide future development in a manner that will complement and enhance social and economic conditions in the county, and lend order to the development process.

But the trends in process point to impending conflict. Areas of the county with the greatest development potential---in the southeast corner---contain most of the county's prime farmlands and mineral deposits. They are also in the line of expanding industrial and residential development north of Columbia, principally along I-77. By nature, these uses are inherently incompatible, setting the stage for conflict.

The potential for conflict is further compounded by neighboring Richland County's Comprehensive Plan for the I-77 corridor, which designates much of the contiguous area in Richland County for "development", meaning any number of uses under certain conditions. The logic in this approach is to maximize flexibility in meeting future development proposals "as the area has no particular development trend, but has potential for various uses."

East of SR 227 (Hood Road in Fairfield County), the Richland County Plan recommends low-density residential development. Assuming a continuation of "like development" into Fairfield County, east of Hood Road, similar low-density residential development may be expected. Development patterns along the I-77 corridor into Fairfield County will be shaped entirely by economics, on a first come basis, according to the Richland County Plan.

These "planned" scenarios mirror current development trends based principally on economics and locational preference. But they do little to remedy the potential for conflict in Fairfield County or insert order into the development process.



#### LAND USE PLAN ELEMENT

The Land Use Plan Element of the Comprehensive Plan is designed to do both---bring order and compatibility to the development process---establishing goals and objectives for the various areas of the county. Based in part on factors influencing development, projected needs and potential, goals and objectives are embodied in the following generalized Land Use Classifications, which are portrayed by the use of symbols on the accompanying Comprehensive Development Plan Map.

Land Use Map Symbol	Generalized Land Use Area Classification
GD	General Development
	Commercial Clusters, within 500'
RC-D	Residential Conservation • and Development
IND	Industrial Development
RR	Rural Development-Resource Preservation

### GD, General Development

Areas so designated are projected to accommodate most of the future growth and development in the county. As a result, multiple uses (residential, commercial and industrial) are expected in these areas, tempered principally by market conditions. Here "highest and best use" options are advocated by the Plan. But with general, open-ended development options, there is inherent potential for land use conflicts mentioned previously. To prevent this, the Plan recommends the adoption of development standards for these areas:

- (1) to ensure that adequate buffers, screens, and setbacks will be provided between potentially incompatible uses;
- (2) to address storm drainage and sedimentation problems created by new development;
- (3) to regulate outdoor advertising and help prevent visual blight and obstruction to travel;

- (4) to control operational nuisances of nonresidential uses such as outdoor lighting, noise, etc.
- (5) to ensure the adequate provision of open space in large scale and multi-family projects;
- (6) to require uniform setbacks along major streets and roads for visual clearance and future road widening;
- (7) to enhance the outcome of development with required landscaping and amenities;
- (8) to ensure the provision of adequate offstreet parking and loading;
- (9) to control the location of certain potentially hazardous, obnoxious, or offensive uses;
- (10) to protect environmental resources in the path of development, i.e. trees, historical places, etc.

Standards addressing the above will make it possible to exercise flexibility in the use of one's property in these areas, so long as the proposed use is developed and sited in a manner that will not infringe on the rights of neighboring property owners or compromise values.

### <u>Objective</u>

The objective of this classification is to permit land use and development flexibility in an effort to meet market conditions and demands---to encourage the "highest and best use of land", while protecting existing land uses and environmental resources from any negative by-products or fall-out from new and expanded development.

### Commercial Clusters

Where the symbol • is established on the Plan Map, commercial development is recognized as a viable option to the larger land use designation within which the symbol is contained. Within generally 500 feet of the symbol commercial concentrations and clusters are recommended to meet the retail and service needs of area residents.

## <u>Objective</u>

The objective of this land use designation is to meet in orderly concentrations the need for commercial development in areas dominated by residential and/or rural uses, and to discourage strip commercial development.

## RC-D, Residential Conservation and Development

Without some type of land use regulations or development standards, it is difficult to maintain quality subdivisions and protect existing residential areas.

Even deed restricted subdivisions are vulnerable to incompatible development from all sides, as peripheral lots are exposed to and unprotected from neighboring development, whatever the use.

Residential security is of prime concern in any community. But all residential areas in unincorporated Fairfield County lie unprotected. Many already have been compromised as a result, by mixed, incompatible land uses.

Still, all is not lost. There remains homogeneous quality subdivisions within the county, as well as a number of nearby sites with residential potential. However, both need and warrant "protective zoning". Without it, they are vulnerable to an intrusion of mixed and potentially incompatible land uses.

## **Objective**

Areas designated RC-D on the accompanying Plan Map are designed to protect existing residential uses and nearby areas with residential potential, exclusively for residential purposes, and to restrict or prohibit any use of land which would compromise or otherwise infringe on the prevailing character of established and planned residential areas.

#### IND, Industrial Development

Specific sites within the designated IND on the Plan Map have been investigated and found to have industrial potential. Most are relatively level, facilitated by or planned for water and sewer, and easily accessible. Many have rail.

Such conditions uniquely qualify these areas for most industrial uses, prompting their reservation principally for future industrial development. The availability of suitable industrial sites is fundamental to industrial development. Where good sites exist, they should be retained, principally if not exclusively for industrial development. One of the tenets of land use planning is to channel development in such a manner as to maximize its contribution to the community. Where there is a need for industrial development, and there exist the necessary sites and infrastructure to support it, care should be taken to encourage and accommodate the industrial use of such areas. Other uses which would preclude the industrial development of such areas, and subsequently compromise the county's ability to attract industry should be prohibited.

### **Objective**

The objective of this classification is to preserve and protect existing industry and potential industrial sites from encroachment by incompatible and inappropriate development. While not excluding all other uses from these areas, they are recommended principally for manufacturing, warehousing, wholesaling, research, technical operations, and similar uses.

## RR, Rural Development-Resource Preservation

Most areas classified RR on the Plan Map generally are outside the path of projected development, characteristically rural and predominantly undeveloped at this time. Moreover, few changes to these areas are anticipated during the life of this Plan. This is not to minimize the importance of these areas to the county however. Open lands, woodlands and wetlands are essential to clean air, water, wildlife, many natural cycles, and a balanced environment, among other things. As a result, they should be protected from encroachment or misuse.

This also includes the retention of agricultural lands, equine farm lands, water resources and historical places, many of which are located in the RR Area shown on the Plan Map. The importance of these areas may be measured in economic terms. And their protection and enhancement are considered critical to the future well being and general welfare of the county.

Just as important to the preservation effort is the development of agri-industrial uses to capitalize on these resources. And what better place to locate such uses than in the rural areas from which the resources are produced. Agri-industrial development, therefore, is viewed not as an incompatible use within the RR Areas shown on the Plan Map, but in a complementary role as a means of more economically utilizing the county's rural resources, without compromising rural values.

Additionally, two major resources targeted for conservation and preservation are waterways and historical places. Waterways

## TABLE XXIX

SUMMARY LAND USE PLAN LEGEND

## Use Classification

General Development (GD)

Residential Conservation and Development (RC-D)

Industrial Development (IND)

(1) unit per 10 acres

Recommended Density (No. Residential

Units Per Acre)

and sewer

but not sewer

(4) units per acre

(1) per acre without water or sewer

(12) per acre with water

(2) per acre with water,

Rural Development-Resource Conservation (RR) Not less than (1) per acre

Principal Use(s) Recommended

Commercial, business, light industrial, multi-family, motels, commercial recreation, residential, institutional and mobile home parks.

Single and multi-family residential uses, townhouses, condominiums, patio homes, triplexes, duplexes, and individual mobile homes, but not mobile home parks.

Industrial, warehousing, distribution, wholesaling, storage, research and testing facilities and plants.

Agricultural and support uses, singlefamily dwellings, mobile homes and small scale convenience and service commercial uses, hunting and fishing lodges, oper air recreation, marinas, and agri-industrial uses.



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- Resource Preservation
- Gommercial Clusters
- Future Fire Station Locations
- △ Future Park Site Locations
- Proposed Highway Improvements

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### Proposed Fire Protection Projects

Comprehensive recommendations for improving and expanding fire protection in the county are contained in the county's <u>Fire</u> <u>Protection Master Plan, 1990</u>. Suffice it to say, the key project elements of the Plan call for constructing four new stations, one of which is now underway (Map VII). Cost estimates and priorities are contained in the Plan, as well as other project details designed to improve fire protection throughout Fairfield County.

#### DEVELOPMENT POLICIES

In addition to the above, the following development policies are hereby established. They form the basis for the planning process by providing a means to evaluate land use proposals for compliance with overall community goals.

- (1) <u>General Policies</u>
  - (a) Encourage planned and orderly growth consistent with the county's Land Use Plan, the capability of the natural resource base and the county's ability to extend or provide the necessary supporting public services and facilities to accommodate development.
  - (b) Provide for the conservation and protection of natural and historic resources through the proper use and management of land, water, soil, forest and mineral deposits.
  - (c) Assure that appropriated public funds provide needed public services and facilities in the most cost-effective manner.

## (2) <u>Residential Policies</u>

- (a) Provide opportunities for an appropriate mix of dwelling types, sites and prices in order to meet the current and projected housing needs of county residents in accordance with their financial capabilities and preferences.
- (b) Encourage new housing development to strive toward the best principles of site planning and residential design through the enforcement of the county's subdivision regulations and building codes.

- (c) Promote new and innovative approaches to residential development which will expand the variety of housing opportunities and/or minimize public and private costs.
- (d) Encourage traditional and non-traditional residential development, including two-family unit structures, modular homes and mobile homes, to locate in subdivisions or parks so as to discourage strip development along major highways.
- (e) Ensure through the enforcement of appropriate development standards, that the level and type of residential development will be compatible with the physical limitations of the land and established land uses in an area. Also, ensure that the transitions in size, site standards and other characteristics from residential area to residential area are compatible.
- (f) Coordinate the expansion of residential development with information regarding potential impacts on schools, water and sewer systems, drainage, transportation systems, and effects on the environment.
- (g) Encourage the maintenance and/or improvement of the individual character and identity of established neighborhoods, communities and rural settlements.
- (h) Enhance the county's existing supply of housing stock by promoting appropriate conservation practices, supporting rehabilitation and encouraging the replacement of dilapidated structures.
- (i) Support both public and private means of providing additional low and moderate income housing as needed and seek assistance to upgrade existing housing for lower income groups.
- (3) <u>Commercial Policies</u>
  - (a) Require that commercial establishments incorporate adequate site design standards in regard to building locations, off-street parking, loading, signs and landscaping to ensure minimal interference to traffic movement and impact on
adjacent land uses.

- (b) Encourage the clustering of commercial shopping facilities in nodes which are convenient to population concentrations.
- (c) Discourage the spread of strip-type commercial development.
- (d) Prohibit the encroachment of incompatible commercial development into established residential areas.
- (e) Promote the adaptive reuse of existing structures when appropriately located for commercial use.
- (f) Coordinate the growth of commercial development with information regarding the potential impact on community facilities, utilities, transportation, adjacent and nearby land uses and effects on the environment.

## (4) <u>Industrial Policies</u>

- (a) Encourage industrial growth that provides quality employment opportunities and makes effective use of the county's resources.
- (b) Encourage the development of industrial uses in areas which will maximize the potential for safe, efficient and compatible operations while minimizing excessive infrastructure improvements and service costs to both industry and government.
- (c) Seek to establish and maintain a balanced relationship between industrial, commercial and residential growth to ensure a stable and healthy tax base.
- (d) Pursue the development of planned industrial districts and discourage the location of industrial uses in rural or natural resource areas.
- (e) Encourage the development and/or expansion of industrial uses which do not produce excessive noise, smoke, dust or other particulate matter, vibration, toxic or noxious waste materials, odors, fire and explosive hazards or other detrimental impacts.
- (f) Promote the location of industrial uses in areas which have compatible soils, drainage and other

environmental characteristics which do not pose severe constraints to site preparation.

- (g) Coordinate the location of industrial development with the provision of appropriate road, rail, and pipeline facilities and information regarding potential impacts on community facilities, utilities, adjacent and nearby land uses and effects on the environment.
- (h) Identify and reserve appropriate lands for future industrial development and protect these lands as well as existing industry from encroachment by interim land uses which would detract from or preclude their future industrial utility.

## (5) <u>Public Services and Community Facility Policies</u>

- (a) Extend and improve public services and facilities on a priority basis into areas with an existing need or into areas where the timing for development is approximately planned.
- (b) Coordinate all capital improvement plans of the various utility providers in the unincorporated areas of the county to assure they are mutually supportive and comply with overall growth and development concepts.
- (c) Identify and establish an appropriate mechanism to provide a thorough assessment of the availability of public services and facilities prior to making decisions which impact undeveloped areas of the county.
- (d) Promote development in those undeveloped areas of the county presently served or planned for water, sewer and other services.
- (e) Discourage the use of septic tanks and settling ponds for all but low-density residential development in the Rural Development and Resource Preservation areas.

## (6) <u>Transportation Policies</u>

(a) Coordinate the development of county transportation facilities with regional system improvements to promote the efficient provision of transportation services and to reduce travel time and congestion.

- (b) Ensure adequate rights-of-way for future road improvements and expansions. Right-of-way dedication requirements and building setback lines will be maintained for a heirarchical system of roads based on anticipated level and nature of future use.
- (C) Protect the safety and traffic-carrying capacity of interchange areas and major thoroughfares from adverse adjacent land development by minimizing curb cuts along such corridors.
- (d) Ensure the provision of safe and adequate parking facilities suitable to each type of development, and establish requirements that vehicular circulation within new development areas function efficiently and safely.
- (e) Enact legislation to protect the county's airport.
- (7) Open Space and Recreation Policies
  - (a) Ensure the availability and accessibility of a variety of active and passive recreational opportunities for all persons in the county, including the physically, socially and economically handicapped.
  - (b) Secure adequate future sites for recreation activities by identifying land and water areas having the best combinations of natural features, size and location suited for the type of experience to be provided. These sites should be acquired by the county or some other public entity and dedicated to recreation development and use.
  - (C) Preserve the overall positive qualities of the natural environment which give the county its character, and preserve those areas which have important recreational, scenic, historic, archeological, educational and aesthetic values.
  - (d) Encourage land development practices that reserve open space within or close to developed sites. Such open space should preserve the land's natural features and provide opportunities for the development of active recreation facilities.

(e) Achieve efficient use of multi-purpose open spaces which help to define development concentration, serve as buffers between dissimilar development and/or protect sensitive natural areas.

## (8) Natural Resource Utilization and Conservation Policies

- (a) Maintain and enhance the present quality of the county's natural environment and resources as a priceless attribute which should be shared, enjoyed, protected and passed on to future generations.
- (b) Protect natural resources from development which would create significant negative environmental or economic impacts. Floodplains, steep slopes, and wetlands are natural features that, when developed, could create significant negative impacts on the surrounding environs.
- (c) Ensure that the development of land and water resources proceeds in a manner consistant with resource capabilities.
- (d) Protect water quality by limiting development in hydrologically sensitive areas and preserving areas which are necessary for watershed protection.
- (e) Provide opportunities for agricultural uses in appropriate areas of the county and protect such areas from the indiscriminate encroachment of incompatible land uses.
- (f) Use land for the purpose for which it is best suited based on its resources capabilities and land use suitabilities.
- (g) Support the protection of historic, architectural, archaeological and cultural resources in the county and establish appropriate rules, regulations and ordinances to enhance and protect these resources.

#### SECTION VII

#### PLAN IMPLEMENTATION

Moving from the drawing board to reality is seldom an easy task in any endeavor. It is particularly difficult where the proper tools for implementation are not in place. Such is the case in Fairfield County.

But what can be done to reach the goals and objectives of this Plan? To start with, the county can begin a media blitz to secure public backing, then move to enact the necessary legislation for implementation.

Chronologically, the recommended process is as follows:

- (1) <u>Air the plan</u> at public meetings and through the media.
- (2) <u>Adopt the plan</u> as an official guide to future development.
- (3) Maintain the plan.
- (4) <u>Coordinate the plan</u> with the plans of other agencies operating in the county.
- (5) Enact development and land use regulations to assure plan compliance and implementation.

#### AIR THE PLAN

Public awareness and participation in the land planning process are essential to its acceptance and use as a guide to development. Developers, realtors, property owners, agencies, and the general public alike are responsible for many individual decisions influencing future development. Consequently, they should have a hand in the making and execution of it. With public participation and support, implementation may be assured. Clearly, it is essential. It can promote public understanding of the planning process and expose proposed plans and policies to a broad spectrum of interest, whose reaction may make significant improvements in original proposals.

There are several ways in which to secure citizen involvement and support. It may be accomplished through public hearings, announcements, citizen advisory meetings, selected contacts with community leaders, etc. Also, the dissemination of copies of the Plan to interested groups and conducting informal

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#### discussions have proven to be successful.

The final vehicle for effecting citizen participation may be accomplished through the process of educating the public at large. Throughout the critical initial years of the Plan, news releases and editorials are encouraged.

#### ADOPT THE PLAN

The Plan should be given official status, not only by the Fairfield County Planning Commission, but by the County Council as well. It should be adopted by both bodies as a guide to future development.

By so doing, it will elevate the status of the Plan to an official document. Any changes or deviations thereafter would require an amendment to the Plan, thus assuring greater compliance.

## MAINTAIN THE PLAN

No plan is truly comprehensive and no long-range plan provides more than approximate guidelines to future development. A plan is an organized selection of what appears at a particular time to be the best means to reach what seems to be desirable objectives. Both the objectives and the means for reaching them change however, and there must be continuing assessment if the plan is to retain its utility. There also must be an enlarging scope for planning in response to a growing awareness that socio-economic as well as physical improvements lie within the realm of public planning.

This document represents what now appears to be desirable goals and objectives, based on the best knowledge available. As new data are available, it should be analyzed to see whether revisions to the Plan are needed. As new means of implementation become available, the Plan should be reviewed to see what changes might be in order. As change evolves, it should be reflected by the Plan.

This process should be virtually continuous, but in no instance should it be at less than five-year intervals, according to the state code.

## COORDINATE THE PLAN

Cooperation and coordination with other decision-making agencies in the county, the Towns of Winnsboro, Ridgeway and neighboring Great Falls, the state, the region, and the federal government, the Recreation Commission, Fairfield United Action, the Recreation Association, the School Board and other county agencies can spell the difference between success and failure. Interaction with these agencies will help to ensure full cooperation in the implementation of the Plan, and improve the efficiency of the development process.

## ENACT DEVELOPMENT AND LAND USE REGULATIONS TO ASSURE PLAN COMPLIANCE AND IMPLEMENTATION

Currently the county has a number of codes and ordinances designed to impact the development process and improve the outcome, including:

- (1) A Mobile Home Park Ordinance
- (2) A Subdivision Ordinance
- (3) A Flood Damage Prevention Ordinance
- (4) A Building Code
- (5) An Electrical Code

Still, these regulations are insufficient to implement many of the goals and objectives outlined by this Plan. More is needed in the way of (1) development regulations and/or (2) land use restrictions. Without such regulations, implementation of this Plan will be limited. This is a Plan, nothing more; it neither requires nor mandates any action on the part of anyone. And until such time as requirements are imposed, the development process will remain unaltered.

But what type of regulations should the county adopt? There are several alternatives it may consider.

First, there is zoning. A Zoning Ordinance can regulate and control the use and development of land in accord with this Plan. But zoning, per se, is seldom a popular issue, particularly in the more rural areas such as Fairfield County.

A second alternative is a concept referred to generally as "performance zoning" or "development standards". It may embrace in zoning and subdivision regulations and concepts found These are becoming ordinances, and more. regulations increasingly popular in counties where attitudes are hardened toward zoning. They differ from conventional land use (zoning) regulations by concentrating on <u>how to</u> achieve good development rather than segregating development on the basis of use. The type of use proposed for development is seldom regulated. The emphasis is on development standards, thus minimizing negative and enhancing sound development practices. by-products Conventional (zoning) regulations generally reverse this concept, concentrating on the regulation of use rather than the multifaceted impact of development.

This is not to say that conventional zoning and use districting is not a viable development option. It is. In fact, it is the suggested alternative for certain areas of the county. But for those designated for general development, there is a need for more flexibility in responding to market conditions and encouraging the highest and best use of property. These needs are better addressed by the concept of Performance or Development Standards.

Seldom is the highest and best use principal challenged unless it produces negative results, i.e. infringes on the property rights of others, devalues neighboring property, damages the environment, creates traffic or health hazards, strains existing utilities and public facilities, etc. If these and related public interests are protected and perhaps enhanced through the development process, then it is possible for each property owner to build or develop his or her land to its highest and best use. And the right to do so is universally supported. Such is the case with a Performance or Development Standards Ordinance. Property owners are afforded maximum flexibility in responding to market options, provided they act responsibly and in accord with acceptable development criteria, as promulgated by the Ordinance.

Thus, this concept provides for land use flexibility, with emphasis on not how the land is used, but how it is developed.

Clearly, this approach has merit in Fairfield County, where the vast majority of land is still undeveloped, and land use intensity is relatively low outside the Winnsboro area. But there are other areas where modified zoning may be needed to achieve the objectives of the various land use designations.

Exclusive industrial zoning is recommended for those areas identified as having unique industrial potential. Their conservation for such purposes is essential to the future economic well being of the county.

Exclusive residential zoning is recommended for existing quality neighborhoods and nearby areas with residential potential. The protection of these areas against incompatible development is essential to the provision, maintenance and stability of quality residential development in the unincorporated areas of the county.

Protection of the county's natural attributes also is recommended as a means of conserving rural resource areas for future generations.

Therefore, the suggested approach for Fairfield County is a type of "hybrid" ordinance---one containing only a few us

districts, with the primary focus on development and performance standards.

Such an ordinance, properly drafted, could give the county sufficient flexibility to accommodate projected growth, while providing safeguards against development that might compromise existing resources or land uses.

Under this arrangement, regulations will vary from one area classification to another, depending on the development objectives of each. But such regulations would not relate to or control the use of land except in designated Use Zones, where land use regulations are needed and recommended to achieve stated plan objectives.

### CONCLUSION

This document is to be used as a reference and guide to the future development of Fairfield County. It speaks to specific as well as general issues and concerns identified by the research and planning. The Plan represents an attempt to better infuse long-range planning into the day-to-day decisions affecting development.

The Plan should not be viewed as a static or rigid document, but as an elastic guide to development, accommodating change within its broader confines. As such, it should be reviewed regularly for accountabililty, as required by the state codes. In this way, it will remain an effective and current blueprint for development.

Hays 1999

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# PARR CHOALS RESERVOIR FISHERY MANAGEMENT PLAN

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SCEG-261

prepared by:

Willard E. "Gene" Hayes Fisheries Biologist

Freshwater Fisheries District III S.C. Department of Natural Resources

August 1999

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10/11/2006



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Copies of this statement, No. FPC-PWR-1894, are available from the

Federal Power Commission Washington, D. C. 20426

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PARR PROJECT NO. 1894

FAIRFIELD PUMPED STORAGE FACILITY PARR, SOUTH CAROLINA

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#### FOREWORD

The Federal Power Commission pursuant to the Federal Power Act is authorized to issue licenses for terms up to 50 years for the construction and operation of non-Federal hydroelectric developments subject to its jurisdiction, on the necessary condition:

[T]hat the project adopted . . . shall be such as in the judgement of the Commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water power development, and for other beneficial public uses, including recreational purposes . . .\*

The Commission may require such other conditions not inconsistent with the provisions of the Act which may be found necessary to provide for the various public interests to be served by the project.\*\* Compliance with such conditions during the license period is required. Section 1.6 of the Commission's Rules of Practice and Procedure allows any person objecting to Licensee's compliance with such conditions, to file a complaint noting the basis for such objection for the Commission's consideration.\*\*\*

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\*\* 16 U.S.C. Sec. 803(a).
\*\* 16 U.S.C. Sec. 803(g).
\*\*\* 18 C.F.R. Sec. 1.6 (1973).

## PARR HYDROELECTRIC PROJECT No. 1894 - South Carolina

## FINAL ENVIRONMENTAL IMPACT STATEMENT

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## FEDERAL POWER COMMISSION Bureau of Power

## FINAL ENVIRONMENTAL IMPACT STATEMENT

Parr Hydroelectric Project No. 1894 - South Carolina

## SUMMARY SHEET

1. This is an administrative action.

2. The proposed action consists of granting or denying an application by South Carolina Electric & Gas Company (SCE&G) for a new major license for its constructed Project No. 1894. comprising the Parr hydroelectric project, located on the Broad River in Fairfield and Newberry Counties, South Carolina. In addition, Applicant seeks authorization to construct and include within the new license a pumped storage project utilizing an enlarged Parr reservoir to serve as the lower pool. The enlarged reservoir would be developed by raising the elevation of the present Parr dam approximately 9 feet and retaining the existing powerhouse structure and generating equipment. The enlarged reservoir would extend upstream about 13 miles (4.5 miles further than the existing reservoir), and would also serve as the lower pool of the proposed Fairfield pumped storage addition to the project. The pumped storage project would consist of the enlarged Parr reservoir; four random fill dams impounding the upper pool, to be known as Monticello reservoir, having a surface area of 6,800 acres; an intake channel; penstocks; the Fairfield generating station containing eight reversible pump-turbine units having a total generating capacity of 518.4 mw; and other pertinent facilities. The upper pool would provide condenser

cooling water for the currently authorized 900-mw Unit I of the Virgil C. Summer nuclear station (Atomic Energy Commission Docket No. 50-395) and its future 900-mw Unit II. A possible second 900mw nuclear station (totaling three 900-mw Units) to be located on the western shore of Monticello Reservoir, is also contemplated by the Applicant. However, Commission authorization to use the upper pool (Monticello reservoir) as a source of condenser cooling water has been requested for only the Virgil C. Summer nuclear complex (AEC Docket No. 50-393). The Summer nuclear station and the proposed future nuclear site would be set apart from public entry by nuclear exclusion zones established in accordance with criteria developed by the Atomic Energy Commission. The two reservoirs would have a combined water surface area of 11,200 acres at normal maximum elevations and would provide storage for power generation, cooling waters for a nuclear generating station, and recreational uses. Initial recreation facilities would include a subimpoundment for fishing, an overlook, and two boat launching areas. Appropriate parking, pincicking, water supply, and waste disposal facilities. would be provided.

3. Significant environmental impacts of the proposed project would include: (1) inundation of an additional 9,350 acres of land, eliminating farmland, timber crops, and wildlife habitat, and displacing 25 homes; (2) enhanced recreational

-2-

and (3) changes in existing land use. With prudent evaluation and selection of construction methods and project operation, no serious cumulative adverse environmental effects are foreseen.
 Conditions can be imposed in any license issued to prevent or mitigate adverse effects as well as to replace some lost resources and values.

4. Alternatives considered as realistic include: (1) the use of other means of cooling for the authorized nuclear plant and its future nuclear unit in lieu of Monticello reservoir of the redeveloped Parr project; (2) other generation modes; (3) other pumped storage hydroelectric sites; (4) denial of the application for license; and (5) issuance of a license with conditions that would protect and develop the project resources.

5. The Draft Environmental Impact Statement was circulated for comments on September 7, 1973. Federal, State, and local agencies from whom comments on the draft environmental statement were received include:

A. FEDERAL AGENCIES

Department of Agriculture, U.S. Forest Service Department of the Army, Chief of Engineers Department of Commerce

Department of Health, Education, and Welfare Department of Housing and Urban Development Department of Interior

Department of Transportation, U. S. Coast Guard

-3-

## B REGIONAL AGENCIES

Central Midlands Regional Planning Council

C. STATE OF SOUTH CAROLINA

Department of Agriculture

Department of Archives and History

Forestry Commission

Highway Department

Office of Economic Opportunity

Water Resources Commission

D. LOCAL AGENCIES AND OTHER PARTIES

South Carolina Environmental Coalition

South Carolina Electric & Gas Company

6. The final environmental impact statement was transmitted to the Council on Environmental Quality and made available to the public on or about March 19, 1974.

## 1. DESCRIPTION OF THE PROPOSED ACTION

-South Carolina Electric and Gas Company, Licensee for the existing Parr project No. 1894, filed on July 26, 1972, an application for a new license. This application also proposes redevelopment of the Parr project to include the construction of a new development, the Fairfield pumped storage facility, located adjacent to the existing project and utilizing the existing reservoir enlarged to serve as its pumping pool. The existing Parr project, as redeveloped to include the Fairfield pumped storage facility, will be known as the Parr hydroelectric project.

The July 26, 1972, filing superseded the application for a new license for the existing Project No. 1894, filed June 19, 1969, and the amendments thereto, filed February 27 and November 16, 1970, September 29 and 30, 1971, and March 1, 1972. On January 14, 1974, an amended model study from Alden Research Laboratories was filed. On February 25, 1974, the application was amended by the filing of "Baseline Biota Study."

1.1 PURPOSES OF THE PROPOSED ACTION

The major purposes of the proposed project are to provide the Applicant with additional electrical peak generating capacity and to provide condenser cooling water for the Applicant's Virgil C. Summer nuclear station.

The application includes requests for:

(1) A new license under Section 15 of the Federal Power Act for its existing Parr Hydroelectric Project No.

1894.

(2) Authorization to enlarge the existing Parr reservoir \_to\_serve\_as\_the lower pool of the new pumped storage project.

(3) Authorization to redevelop the project to include a pumped storage project.

(4) Authorization to use the upper pool (Monticello reservoir) of the pumped storage project as a cooling impoundment for the proposed Virgil C. Summer nuclear complex. (The AEC has issued a construction permit for Unit I, Docket No. 50-395.)

Studies furnished by the Applicant show that the upper impoundment cooling capacity is adequate for two 900-mw nuclear units. A possible second 900-mw nuclear station (totaling three 900-mw units) would require alternative cooling means. The first unit of the Summer nuclear plant is scheduled for operation in 1977; however, the upper reservoir of the Fairfield project would be needed prior to that time to supply cooling water for testing purposes, provided that a license is issued for the pumped storage project. If a license is not issued, an alternative means of cooling the nuclear plant will have to be provided.

Applicant would set the Summer nuclear station and the possible future nuclear site apart from public entry by nuclear exclusion zones established in accordance with criteria developed by the Atomic Energy Commission.

1-2

#### 1.2 GENERATING CAPACITY

The existing Parr project has an installed capacity of 14,880 kw. The proposed Fairfield pumped storage facility would have an initial installed capacity of 259,200 kw scheduled for operation in 1976, and an additional 259,200 kw scheduled for operation in 1978. The proposed initial installation would have a dependable generating capacity of 240 mw. The final installation would increase the facility's dependable capacity to 480 mw. Including the first 900-mw unit of the Summer nuclear plant, scheduled for operation in 1977, the total dependable capacity to be added to the Applicant's system will amount to 1,380 mw from 1976 to 1978. This amounts to an increase of 45 percent in system capacity and accounts for all of the Applicant's scheduled capacity additions in that period.

The average annual energy generated by the existing Parr project is about 84,000,000 kwh. Under the redevelopment plan, this would increase to about 88,000,000 kwh,due to the higher average operating head resulting from the enlarged Parr Reservoir.

It is estimated that the proposed Fairfield pumped storage development would generate about 650,000,000 kwh in 1978 and 800,000,000 kwh in 1982. The increased generation would result from operating at a higher plant factor, because of the availability of additional low-cost nuclear pumping energy from the second unit of the Summer nuclear plant.

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1.3 NEED FOR POWER

The Federal Power Commission Staff has reviewed peak load and energy growth in the Applicant's service area, and also in the Virginia-Carolinas subregion of the Southeastern Electric Reliability Council, of which Applicant's service area is a part. Table 1-1 shows the estimate of Applicant's peak-load growth for the years 1975 to 1980. The table also shows scheduled capacity additions to the system for the same period. Without the Fairfield capacity, system reserve in the year 1976 would be only 6.4 percent, and in 1978 it would be only 6.9 percent. This appraisal does not include an estimate of the effects of an organized energy conservation program in the Applicant's area. Such a program might have an effect similar to that detailed in Section 8.3. The approximate effect would be to delay the growth figures shown in Table 1-1 by one year at most.

Generally, a system reserve of about 20 percent of system peak load is considered the minimum required for reliable operation. The Virginia-Carolinas subregion is planning on a minimum reserve capacity of about 19 percent in the middle and later years of the 1970's. On this basis, capacity additions equivalent to the Fairfield facility are essential in 1976 and 1978 to help meet projected reserve requirements. Even with the availability of the Fairfield capacity, the Applicant's reserve would only be 14.3 percent in 1976 and 14.4 percent in 1980; hence other sources of reserve capacity might be required

# Table 1-1

# Peak Load and Capacity Forecast, 1975-1980.

South Carolina Electric & Gas

	1975	1976	1977	1978 ]	L979 :	1980
Load-Peak Demand mw						
Area Peak	2563	2857	3186	3554	3960	4410
Contract Sales	149	149	149	149	70	
Total Load	2712	3006	3335	3703	4034	4410
				1		
Capacity - mw				. ]		
		ļ				
Capacity Additions					611	
Fossil	-	-		<b>-</b> .	011	-
Summer Nuclear	-	240	900	240	_	-
Fairfield Pump Hydro	-	240	_	240	_	_
motal Canadity						
Total Capacity	2526	2526	2526	2526	3137	3137
HVARO	243	243	243	. 243	243	243
Gas Turbine	289	289	289	289	289	289
Pump Hydro	_	240	240	480	480	480
Nuclear	-	-	900	900	900	900
Total	3058	3298	4198	4438	5049	5049
Purchases	140	140	-	-	-	· -
			· · · ·			
Total Capacity	1 23.00	2420	4100	1130	50/0	5049
Available	3198	3438	4190	4450	15045	5049
Boserve with		1	1			
Fairfield	486	432	863	735	1015	639
FUILLEIG						
Reserve without						
Fairfield	486	192	623	255	535	159
Percent Reserve with	1					
Fairfield	18.0	14.3	3 25.8	19.8	25.2	14.4
			1		1	
Percent Reserve		-				
without Fairfield	18.0	6.	4 . 18.7	6.9	1.13.3	0.0
1	•	1	1	L	1	I .

on a short-term basis, such as purchases from neighboring utilities or small additional gas turbine installations.

1.4 LOCATION AND RELATIONSHIP TO OTHER HYDRO PROJECTS

The redeveloped Parr project would be located in Fairfield and Newberry Counties, with the major portion of the project in Fairfield County. The project site is along the Broad River, about 26 miles northwest of Columbia, South Carolina, at river mile 28 (Figure 1-1).

The site includes a fossil-fuel steam electric generating plant, a gas turbine plant, and an existing hydroelectric plant (Parr Project No. 1894), as well as the decommissioned Virginia-Carolinas tube-reactor nuclear power experimental plant.

The Broad River, is one of the major headwater tributaries of the Santee River Basin and has its origin in the Blue Ridge Mountains of North Carolina. The Broad River joins with the Saluda River at Columbia, South Carolina, to form the Congaree River, which flows into Lake Marion of the Santee-Cooper project, where its confluence with the Wateree-Catawba River forms the Santee River proper.

The central portion of the Santee Basin lies in the industrial Piedmont Crescent that extends from Raleigh, North Carolina, to Atlanta, Georgia. The basin is served by 60 electric utility systems, South Carolina Electric & Gas being one of the five largest. Hydroelectric developments in the basin and a basin profile are shown in Figures 1-2 and 1-3, respectively.

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Columbia

PROJECT



STATUS

POTENTIAL

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POWER PLANT

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# Figure 1-2. Basin Map, Santee River

Source: Federal Power Commission Santee River Basin Development Report



The Broad River drainage system contains 18 hydroelectric projects of which eight are located on the main stem. Table 1-2 shows data for these projects. Of these eight plants, three are operating under FPC license. In addition, license applications for four projects on the main stem and six projects on tributaries are being processed.

There are also 11 hydroelectric projects located within the Saluda, Santee, and Cooper River systems. One of these projects is on a tributary of the Saluda River, and eight are on the main stem. The Santee-Cooper project has one powerhouse on the Santee River and one on the headwaters of the Cooper River drainage. No hydroelectric projects are located on the Congaree River. Six of the 11 hydroelectric projects are operating under existing licenses, and three have applications for licenses pending. Pertinent engineering data for each plant are shown in Table 1-3.

Besides Parr, Applicant owns two other hydroelectric plants on the Broad River: Neal Shoals, located 32 miles upstream from Parr Shoals, and Columbia, located 26 miles downstream. These three plants, all under FPC licenses, furnish a total capacity of 30,680 kw to the Applicant's system. Each plant has sufficient pondage to provide six hours of continuous generation.

Applicant also owns two other hydroelectric plants, Saluda on the Saluda River and Stevens Creek on the Savannah River.

## Table 1-2 '

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						•	[
Plant name	Lake Lure	Tuxedo	Turner	Cliffslde	Shelby	Gaston Sho	als
pate license expirer	2001 4/	2303 a/	2563 <u>a</u> /	} -	] –	2332	
Owner Town	of Lake Lure	Duke Power Co.	Duke Power Co.	Cone Mill Corp.	Lily Mills Co.	Duke Power	co.
River	Broad	Green	Green	Second Broad	First Broad	Broad	11
River mile	161	42	23	2	4	110	
Drainage area, sq. mi.	95	42	126	211	285	1,250	
Mean flow, cfs.	170	90	280	295	380	2,030	
Spillway design, cfs.	-	6,300	34,000	-		-	
Elevations, feet, msl l/							
Top of dam 2/	-	2,020.8	922.6	-	-	613.4	
Max. water surface 3/	-	2,017.4	918.6	<del>~</del> ·	_	614.2	
Top of gates 4/	991 ·	-	-	702	660	605.4	
Crest of spillway	· •	2,012.6	911.6	698	658	599.4	
Max. power pool	991	2,012.6	911.6	702	660	605.4	
Min. power pool	975	2,005.6	908.6	698	660	600.4	l
Normal tailwater <u>5</u> /	887	1,717.1	825.9	672	635	558.6	
Min. tailwater <u>6</u> /	883	1,715.3	822.8	672	635	553.4	
Reservoir		······································		· · · · · · · · · · · · · · · · · · ·	·		
Max. power pool, acre-ft.	-	10,204	11,927		<b>~</b> .	- (	j
Min. power pool, acre-ft.	-	8,069	10,657	· ~	-	_ · · ]	
Usable for power, acre-ft.	13,500	2,135	1,270	Pondage	~	1,150	
Max. area, acres	900	324	438	-	-	251	
Heads, feet 1/	•						
Gross static 7/	108	297.3	88.8	30	25	52.0	
Net effective <u>B</u> /	100	285.5	83.2	28	25	46.5	
Min. net	84 ·	278.5	80.2	26	25	41.5	
Power plant	2 600	E 000	5 500	1 625		0.140	
installed capacity, KW	2,000	5,000	0,000	1,025	000	3,140	
Auxillary capacity, KW	3 000	5 900	5 600	1.300	600	7 200	
Min. nead capability, Kw	10 000		14,600	2 900		30 100	
Avy. ann. generation, myn	1927	1920	1925	1973	1000	1000	
Construction date	1761	1320	1723	L, , , ,	1900	1900	

#### Data for Hydroelectric Projects, Broad River System

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# Table 1-2 (contd)

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### Data for Hydroqlectric Projects, Broad River System

Plant name Project number Date license expires	Cherokee Falls 10/	' 99 Islands 2331	Spartanburg	Clifton No. 3 2626	Clifton No. 1 2625	Clifton No. 2 2625
Owner	Burlington Ind I	uke Power Co.	Comm. of Pub. Wks	. Dan River Mills	Dan River Mills	; Dan Kiver Mills
River River mile Drainage arca, sq. mi. Mean flow, cfs. Spillway design, cfs.	Broad 102 1,500 2,350	Broad 91 1,550 2,400	South Pacolet 2 93 150	Pacolet 33 318 440	Pacolet 32 319 440 -	Pacolet 31 320 440 -
Elevations, feet, msl 1/ Top of dam 2/ Max. water surface 3/ Top of gates 4/ Crest of spillway Max. power pool 5/ Min. power pool 6/ Normal tailwater Min. tailwater	543 539 543 541 524 523	523.6 524.6 511.1 509.1 511.1 506.1 442.9 437.4	778 773 773 778 761 722 720	626 621 625 620 598 597	- - 597 597 592 576 575	- 575 572 575 571 558 557
Reservoir Max. power pool, acre- Min. power pool, acre- Usable for power, acre Max. area, acres	ft. – ft. – -ft. Pondage –	- 4,127 885	4,462 <u>9/</u> 1,074 Pondage 1,914	- Pondage -	- - Pondage -	- Pondage
lleads, feet <u>1</u> / Gross static <u>7</u> / Net effective <u>B</u> / Min. net	20 19 17	73.7 67.9 62.9	58 56 39	28 27 22	22 21 16	18 17 13
Power plant Installed capacity, kw Auxiliary capacity, kw Min. head capability, Avg. ann. generation, Construction date	1,750 0 kw – mwh 5,000 1955	18,000 250 16,300 65,600 1910	1,000 0 1,000 4,400 1925	1,100 0 1,000 2,800 1903	800 0 500 3,000 1929	532 0 500 2,100 1888

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#### Table 1-2 (contd.)

#### Data for Hydroelectric Projects, Broad River System

Plant name Project number Date license expires Owner	Pacolet 2621 a/ Pacolet Mfg. Co.	Lockhart 2620 <u>a</u> / Lockhart Power Co.	Neal Shoals 2315 12-31-93 S.C.E.&G. Co.	Print Crash	Parr Shoals 1894 6-30-70 S.C.E.&G. Co.	Columbia 1895 6-30-70 S.C.E.&G. Co.
River River mile Drainage area, sg. mi. Mean flow, cfs. Spillway design, cfs.	Pacolet 23 460 620 -	Broad 72 2,600 3,640	Broad 60 2,730 3,800	Middle Tyger 10 72 95	Broad 28 4,750 5,600	Broad 2 5,230 6,300
Elevation:, feet, msl 1/ Top of dam 2/ Max. water surface 3/ Top of gates 4/ Crest of spillway Max. power pool Min. power pool Normal tailwater 5/ Min. tailwater 6/	- 524 521 524 518 498 497	410   396 390 344 343	340.8 	- 755 753 755 749 701 701	272.2 257.2 257.0 256.0 223.0 223.0	171.0 - 153.8 153.8 153.8 148.8 119.3 118
Reservoir Max. power pool, acre-ff Min. power pool, acre-ff Usable for power, acre-f Max. area, acres	t t Et. Pondage	- Pondage 300	- Pondage 600	- Pondage -	Pondage 2,925	- Pondage 265
<pre>Heads, feet 1/ Gross static 7/ Net effective B/ Min. net</pre>	27 26 20	53 52 46	26 24 21	54 54 48	35.0 33.0 31.0	36.0 32.0 27.0
Power plant Installed capacity, kw Auxiliary capacity, kw Min. head capability, kw Avg. ann. generation, mw Construction date	800 0 600 nh 2,700 1937	12,300 0 13,000 70,000 1920	5,200 0 0 30,000 1905	1,200 0 1,000 2,300 1895	14,880 0 13,000 75,000 1914	10,600 0 7,000 50,500 1928

License application pending.

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Figures containing decimal indicate data furnished by owner, others have been estimated from best available data. Bulkhead or embankment. 3/ Experienced or expected. 4/ Or flashboards. 5/ With plant at normal full operation.

1275 With plant shut down or maximum power pool at downstream plant. 7/ Maximum power pool minus minimum tailwater. Maximum power pool minus normal tailwater and losses. 9/Water supply only - power generated when excess water available.

#### Table 1-3

# Data for Hydroelectric Projects, Saluda-Santee River System

Owner	12-31-93 Duke Power Co.	2428 <u>a</u> / J.P. Stevens & Co.	The Kendall Co.	The Kendall Co.	2465 12-31-93 Duke Power Co.	Rigel Textile
River	Saluda	Saluda	Saluda	Saluda	Saluda	Saluda
River mile	137	120	. 117	114	103	89
Drainage area sq. mi.	315	375	409	414	531	564
Mean flow, cfs. Spillway design, cfs.	600	740 . –	750 -	800	880 -	1,000
Elevations, feet, msl 1/		†	ран такана калана каларана. }			
Top of dam 2/	855.7	-	· _	702	638.2	-
Max. water surface 3/	854.2	· _	!	_	636.7	· _ ·
Top of gates 4/	849.0	774	725	700	634.0	508
Crest of spillway	845.7	773	720	696	628.6	503
Max, power pool	849.0	774	725	700	634.0	5.08
Min. power pool	846.0	773	723	699	628.6	504
Normal tailwater 5/	807.6	750	700	662	592.0	457
Min. tailwater <u>6</u> /	804.9	748	700	658	590.0	456
Reservoir	·* ·			•	· · ·	
Max, power pool, acre-ft.	7,228			_	-	
Min, power pool, acre-ft.	5.684	_	-	· _	-	-
Usable for power, acre-ft.	1,544	Pondage	Pondage	Pondage	Pondage	Pondage
Max. area, acres	475		_		465	-
Head, feet 1/		•	•		· · · · · · · · · · · · · · · · · · ·	
Gross static 7/	44.1	26	25	42	44.0	52
Net effective 8/	41.1	24	25	38	41.7	51
Min. net	38.1	23	23	37	36.3	47
Power plant		•	··· · <del>································</del>		•	
Installed capacity, kw	2,400	1,000	1,650	3.280	3.500	5.000
Auxiliary capacity, kw	70	0	0	0	. 55	0
Min, head capability, kw	2,100	500	500	1.000	-	5.000
Avg. ann. generation. mwh	7.800	6.700	6.000	10,000	12.700	19,000
Construction date	1905	1937	1920	1894	· 1906	1906

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Plant name Project number Date licensc expircs Owner	Boyds Mill 2649 <u>a</u> / Duke Power Co.	Buzzard Roost 1267 2-10-85 Greenwood Co. <u>9</u> /	Saluda 516 8-4-77 S.C.E.&G. Co.	Spillway 199 4-1-76 S.C.P.S. Auth. <u>b</u> /	Pinopoli   199 4-1-76 S.C.P.S. Au	s th. <u>b</u> /
River River mile Drainage arca, sq. mi. Mean flow, cfs. Spillway design, cfs.	Reedy 17 224 315 -	Saluda 60 1,150 1,650 147,500 \	Saluda 12 2,400 2,700 -	Santee 87 14,700 2,200 800,000	Cooper Can 49 15,000 14,000 -	al
Elevation, feet, msl 1/ Top of dam 2/ Max. water surface 3/ Top of gates 4/ Crest of spillway Max. power pool Min. power pool Normal tailwater 5/ Min. tailwater 6/	540.8 543.2 535.3 532.7 535.3 535.3 487.6 485.9	457.0 450.0 441.5 36 415.0 34 440.0 420.0 385.0 375.0	375.0 368.0 5.0 & 362.0 0.0 & 330.0 360.0 330.0 186.5 171.7	88.0 76.8 76.8 63.0 75.7 60.0 27.0 26.0	88.0 75.2 - 75.2 60.0 7.2 -1.5	
Reservoir Max. power pool, acre-ft. Min. power pool, acre-ft. Usable for power, acre-ft. Max. area, acres	- - Pondage 246	270,000 96,000 174,000 11,400	2,096,000 1,040,000 1,056,000 51,000	1,450,000 350,000 1,100,000 110,600	1,110,000 450,000 660,000 60,400	
Heads, feet 1/ Gross static 7/ Net effective 8/ Min. net	49.4 47.4 47.4	65.0 53.5 33.5	188.0 172.0 142.0	49.7 46.7 31.0	76.7 67.5 52.3	
Power plant Installed capacity, kw Auxiliary capacity, kw Min. head capability, kw Avg. ann. generation, mwh Construction date	960 35 5,200 1909	15,000 0 8,000 47,000 1940	208,750 <u>10/</u> 0 182,000 <u>10/</u> 236,800 1930	1,920 0 1,900 12,000 1950	132,65 0 91,100 657,000 1942	

License application pending. b/ South Carolina Public Service Authority.

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Figures containing decimal indicate data furnished by owner, others have been estimated from best available data. Bulkhead or embankment. 3/ Experienced or expected. 4/ Or flashboards. 5/ With plant at normal full operation. With plant shut down or maximum power pool at downstream plant. 7/ Maximum power pool minus minimum tailwater.

Maximum power pool minus normal tailwater and losses. 9/ Owned by Greenwood County Electric Power Commission and leased to Duke Power Company. 10/ Includes 78,750 kw additional unit under construction.

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The total existing hydroelectric capacity owned by the Applicant is about 250 mw, which represented about 10 percent of the total system's dependable capacity of 2,427 mw at the end of 1972.

1.5 DESCRIPTION OF EXISTING AND PROPOSED FACILITIES

The project as proposed would consist of: (1) the existing 14,880-kilowatt Parr Hydroelectric Project No. 1894, as modified to include 9-foot high Bascule gates atop the dam, forming an enlarged Parr reservoir which would serve as the lower pool of the 518.4-mw Fairfield pumped storage addition; and (2) an upper reservoir (Monticello), which would also be used as a cooling impoundment for the currently authorized 900-mw Unit I and the future 900-mw Unit II of the nuclear electric power plant.

The plans showing the layout of the existing project, the proposed redevelopment, and technical features of project works are shown in Figures 1-4 through 1-8.

The existing project is a conventional hydroelectric facility comprising: (1) a 2,715-foot long dam having a 39-foot high, 2,000-foot long concrete overflow section with a crest elevation of 257.0 feet msl, joined on the westerly end by an earth dike about 300 feet long and on the easterly end by a 300-foot long integral powerhouse section, a 90-foot long concrete nonoverflow section, and a 25-foot long earth-fill section; (2) a reservoir having a surface area of 1,850 acres with normal surface elevation of 257.0 feet msl, extending about 8-1/2 miles upstream; (3) a steel-frame brick powerhouse containing six

enerators rated at 2,480 kilowatts each, and two empty bays; and (4) all other facilities appurtenant to operation of the project, including a transmission tie to the 13,200-volt bus at the Applicant's nearby Parr steam electric plant.

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The redeveloped project for which a license is requested of the Federal Power Commission would consist of four major project parts.

The first part would be (a) the existing Parr powerhouse structure and generating equipment; (b) the existing Parr dam, raised in elevation approximately 9 feet by installing Bascule gates atop the dam; and (c) an enlarged Parr reservoir having a surface area of 4,400 acres at maximum normal headwater elevation of 266 feet msl, extending upstream for about 13 miles, and having a usable storage capacity of 29,000 acre-feet in a drawdown of 10 feet. The enlarged Parr reservoir would continue to provide water for operation of the existing Parr project, would serve as the lower reservoir of the proposed pumped storage project, and would have sufficient capacity to provide for eight hours of continuous pumped storage generation at 480 mw. The existing dam, shown with the proposed Bascule gates, and the existing powerhouse are depicted on Figures 1-4 and 1-5.

The second part would be the Fairfield pumped storage facility, comprising (a) an upper pool (Monticello reservoir) having a surface area of 6,800 acres and a gross capacity of 400,000 acre-feet at normal elevation of 425 feet msl, with a usable capacity of 29,000 acre-feet in 4.5 feet of drawdown; (b) a 5,000-



foot long, 180-foot high Frees Creek dam and three smaller saddle dams having lengths of 3,400 feet, 1,700 feet, and 900 feet and varying in height from 50 to 90 feet, all of earth-fill, with crests at an elevation of 434 feet msl, as shown in Figure 1-7; (c) a 400foot wide, 600-foot long intake channel in the south abutment of the main dam terminating at a gated intake structure with invert at elevation 375 feet, and four 26-foot diameter surface penstocks. bifurcating into eight 18-foot diameter concrete-encased penstocks connecting to the powerhouse; (d) the Fairfield powerhouse, containing eight reversible pump-turbine units having a minimum capability of 83,000 hp each, at the minimum head of 150 feet, directly coupled to eight motor-generators, each with a nameplate rating of 64,800 kw in the generating mode and 100,000 hp when operating as a motor; (e) a switchyard at the powerhouse; (f) two 6,000-foot long, 230-kv transmission lines connecting the Fairfield plant with the Summer nuclear plant; and (g) all other appurtenant facilities.

The Fairfield powerhouse and switchyard are shown schematically in Figure 1-8.

The third part would be recreational features, including (a) a boat launching area on Parr reservoir adjacent to the crossing of Hellers Creek by County Road 28; (b) a separate 300-acre subimpoundment within the northernmost portion of Monticello reservoir, containing a public boat launching area with parking and sanitary facilities, on land to be purchased for











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recreational purposes; and (c) a 23-acre scenic overlook with an observation platform, to be located on the eastern shore of Monticello reservoir, with parking, sanitary, and picnic facilities (Figure 1-1).

The fourth part, the Virgil C. Summer nuclear station, would initially contain a single nuclear reactor and a single 900-mw generator, and would be a major facility of an overall electric power generating complex. A permit to construct the Virgil C. Summer plant and its initially proposed 900-mw unit was issued by the Atomic Energy Commission in AEC Docket No. 50-395 on March 21, 1973. The nuclear plant would utilize a pressurized water reactor, and cooling water would be provided by the Monticello reservoir of the redeveloped Parr project. Authorization to permit utilization of Monticello reservoir as a source of condenser cooling water for the proposed nuclear plant is requested of the Federal Power Commission in this action. A final environmental statement for this nuclear facility was issued by the Atomic Energy Commission in January 1973.

No navigation works or fish ladders, hatcheries, or protective devices are affected by the existing project or the proposed redevelopment.

A geological investigation of the project sites, conducted by the Applicant, has revealed adequate foundation conditions for the project structures. The investigation consisted of: seismic refraction surveys, test borings and test pits, field investigation and mapping of site vicinity, and a magnetic anomaly survey. At Dam A, the northernmost dam, the underlying migmatitic rock is overlain by 50 to 90 feet of residual soil, consisting generally of stiff, clayey and sandy silts underlain by saprolitic, generally dense, micaceous silty sand.

The main dam, Dam B , to be constructed across Frees Creek, is underlain by Charlotte Belt gneiss on the north side of the creek, migmatitic rock in the immediate vicinity of Frees Creek, and granodioritic rock on the south side of the creek. On the ridge flanks and slopes to either side of Frees Creek, stiff and dense saprolitic soil, ranging in depth from 10 to 110 feet, overlies the rock. Soft and loose alluvial deposits ranging from 13 to 35 feet deep overlie the migmatitic rock in the Frees Creek-bottom.

Dams C and D, south of Frees Creek, are underlain by granodioritic rock beneath a 40 to 110-foot thickness of saprolitic soil.

Borings drilled near the existing Parr dam generally encountered migmatitic rock, overlain by a 10 to 35-foot thickness of stiff and dense sandy soil. Field evidence compiled by the Applicant suggests that a fault, inactive for over 200 million years, might be located near Parr dam. Future activity of this fault, if it does exist, is considered very unlikely.

The migmatitic rock encountered in the borings drilled in the Fairfield powerhouse area is overlain by 5 to 38 feet of a loose silty sand, increasing in density with depth.

The conclusions drawn in the geological study are: (1) the diverse combination of metamorphosed, sedimentary, and volcanic rock, covered by the varying depths of residual soil underlying the dam and powerhouse sites, should provide adequate support for the proposed facilities; and (2) there are no geological features of the project area which would preclude its use for construction and operation of the redeveloped project.

The staff of the Federal Power Commission utilized this basic geological information and other technical data for its engineering analysis of the project, including the existing structures. This evaluation included a study of the design of project structures for safety and adequacy purposes.

The transmission facilities associated with the project would consist of two parallel 230-kv transmission line circuits, approximately one mile in length, between the Fairfield powerhouse and the Virgil C. Summer nuclear station. The lines would be carried on wooden H-frame structures 60 to 70 feet high. The two circuits would be located on a common right-ofway with about eight structures per circuit. The proposed right-of-way would be 170 feet wide.

A nonproject, 100-kv, double-circuit transmission line belonging to Duke Power Company would have to be relocated to a new right-of-way about 5-1/2 miles in length. The relocated Duke line and the project lines would utilize a common rightof-way 240 feet wide for a distance of 2,000 feet.

Due to the combined limitations of the pumped storage -project and the nuclear cooling impoundment, recreational opportunities would be primarily restricted to three areas: Hellers Creek, the scenic overlook, and the subimpoundment on Monticello reservoir.

Plans for initial development of project recreation facilities include a boat launching area on the Heller's Creek arm of Parr reservoir; a 300-acre subimpoundment fishing area on Monticello reservoir, containing a public boatlaunching area, swimming area, and parking and sanitary facilities; and a scenic overlook on Monticello reservoir, with an observation platform and parking, sanitary, and picnic facilities. No bank fishing, primitive camping on the islands, or water contact sports would be allowed on the main body of Monticello reservoir, since preliminary restrictions by the South Carolina Water Pollution Control Authority classify Monticello reservoir as a waste heat impoundment. Permission to allow swimming in the subimpoundment will be requested after the project is constructed. Estimated costs of initial recreation development and annual operating costs are shown in Table 1-4.

A list of proposed recreational facilities with land areas is given in Table 1-5.

# Table 1-4

Estimated Costs of Initial Recreational Development and Annual Operating Costs

Land 1,416.5 acres at \$450/acre	\$ 637,425.00
Fishing Area Impoundment	325,000.00
Boat Launching Facilities (2)	18,000.00
Overlook & Picnic Area	32,000.00
Total Cost of Initial Development	\$1,012,425.00
Annual Operating Cost of Initial Development	\$ 25,000.00

# Table 1-5

Recreation Development Acreage

		Acres
	Recreational Areas - Initial Development	
	Monticello Reservoir Subimpoundment	300
	Scenic Overlook	 
	Covered Platform Benches (2) Picnic Tables (10) Walkways	
	Parking (15 cars) Water Sanitary Facilities Visitor Center	30
•	Boat Landing Area (Subimpoundment)	
	Parking (10 cars with connected trail Ramp (12' width, concrete) Sanitary Facilities	ers)
	Boat Landing Area (Parr Reservoir)	
	Parking (5 cars with connected traile Ramp (12' width, concrete) Sanitary Facilities	rs) 2
	Total Initial Development	334.0
	Reserved for Future Recreational Developmen General	t,   <u>1,082.5</u>
	Total Recreational Development	1,416.5

1.6 DESCRIPTION OF RESERVOIRS AND CONTROL WORKS

At normal maximum elevation of 266 feet msl, the proposed Parr reservoir would have a usable storage capacity of 29,000 acre-feet and a surface area of approximately 4,400 acres. At normal minimum pool elevation of 256 feet msl, the surface area would be about 1,400 acres and the volume would be about 2,500 acre feet. The operating drawdown of the pool would be 10 feet. Figure 1-9 shows area and storage capacity curves, and Table 1-6 lists certain specific surface areas and storage capacities of the proposed Parr reservoir.

The proposed Monticello upper reservoir would have a surface area of about 6,800 acres and a total volume of about 400,000 acre-feet at normal maximum water surface elevation of 425 feet msl. The maximum daily withdrawal for generating purposes would be 29,000 acre-feet, lowering the pool to elevation 420.5 feet msl, and reducing the surface area to approximately 6,500 acres. Pumping operations at night would refill the reservoir. Figure 1-10 and Table 1-7 give area and capacity curves and a tabulation of surface areas and capacities, respectively.

The recreation subimpoundment proposed for the upper end of Monticello reservoir would have a surface area of about 300 acres with its level maintained at elevation 425



Table 1-6

Parr Reservoir, Surface Areas and Capacities

Elevation (feet)	Area (acres)	Differential Volume (acre-feet)	Cumulative Volume (acre-feet)
253	0		
-		2,500	
256	1,375		2,500
		7,671	
260	2,727		10,171
-		21,329	
266	4,369		31,500
		19,616	
270	5,402		51,116

Source: South Carolina Electric & Gas Revised Application For License July 26, 1972



Monticello Reservoir, Surface Areas and Capacities

Elevation (feet)	Area (acres)	Differential Volume (acre-feet)	Cumulative Volume (acre-feet)
270	37		
280	137	870	870
290	279	2,080	2,950
300	451	5,050	6,600
310	649	5,550	12,150
320	943	7,960	20,110
330	1,242	10,920	31,030
340	1,682	14,620	45,650
350	2,150	19,160	64,810
360	2,730	24,440	89,250
. 370	3,320	30,250	119,500
380	3,920	30,200	155,700
390	4,520	42,200	197,900
400	5,160	48,400	246,300
410	5,880	55,200	301,500
420	6,430	61,550	363,050
430	7,170	68,000	431,050

Source: South Carolina Electric & Gas Revised Application, July 26, 1972 ر در ا مربع مربع

feet msl. The subimpoundment would be separated from Monticello reservoir by a dike and causeway formed by the relocated County -Route 99. The flow between the two lakes would be through a gated conduit of presently undetermined size. After initial filling, the flow into or out of the recreation subimpoundment from Lake Monticello would be regulated to maintain a constant elevation. The water flows from Frees Creek into the recreation lake would not be adequate to fill the recreation pool, and probably would not replace evaporative losses. Consequently, initial filling would be from Monticello reservoir, and thereafter additional water would be provided as necessary.

The maximum depth of Monticello reservoir would be about 130 feet and the average depth would be about 57 feet. The recreation subimpoundment would have a maximum depth of about 65 feet and an average depth of approximately 30 feet.

Thermal stratification with a twice yearly turnover, fall and spring, would normally be expected in a temperate climate in a reservoir the size and depth of the proposed upper pool.

A comparative study of a conventional reservoir (Philpott on the Smith River in Virginia) and a pumped storage project (Smith Mountain on the Roanoke River in Virginia) demonstrated that the large volumes of water circulated in a pumped storage project tended to improve the reservoir water quality.1/ The pumped storage reservoir water tended to be better oxygenated at all depths, and although the natural stratification was not destroyed, the epilimnion was depressed and a higher

than expected dissolved oxygen content was found in the thermocline and the hypolimnion.

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The proposed use of the upper impoundment for cooling waters for a nuclear plant would tend to increase the thermal stratification phenomenon by discharging heated waters on the reservoir surface. Stratification would be beneficial to the operation of the nuclear plant because it would minimize recirculation of cooling waters. 2/

Another factor that would affect stratification of the upper reservoir would be the turbid water which would be pumped into Lake Monticello from the lower pond of the project. This would limit light penetration and absorption, preventing deeper warming and thus tending to create a shallower epilimnion.

As Chen and Orlab have said, "However, while thermal stratification has often created water quality problems in reservoirs, its complete destruction is not necessarily desirable; some thermal structure is necessary to regulate energy loss, and thus control evaporation, and to ensure a varied environment suitable for a diverse and varied biota." 3/

The intake channel to the penstocks would have a surface baffle extending down to elevation 415 feet msl, 10 feet below the maximum reservoir elevation, to minimize the discharge of any heated surface waters into Parr re-

servoir. The apron of the water intake structure where the baffle is located is at elevation 365 feet msl, 60 feet below the normal maximum elevation of the upper pool. This intake design would, in all probability, result in the withdrawal of water from, and discharge of water into, all three strata (epilimnion, thermocline, hypolimnion) of the upper reservoir during summer stratification periods. The amount of water to be withdrawn each day (maximum of 29,000 acre-feet) would be approximately 7 percent of the total reservoir volume. In all probability, this volume of water withdrawn from and returned to the upper reservoir would not completely destroy the stratification, but would increase both the instability of the strata and the dissolved oxygen content of the upper reservoir through entrainment of air and oxygen-rich surface waters during circulation through the powerhouse, tailrace, and intake structures.

1.7 PROPOSED OPERATIONAL MODES

Although the proposed action would raise the height of the existing Parr dam approximately 9 feet and create a weekday reservoir fluctuation of approximately 10 feet, this would not be expected to significantly alter operation of the Parr hydro facility.

The proposed Fairfield pumped storage facility would be operated at or near maximum capacity on weekdays and at approximately half capacity on Sundays. Generation would normally take place between 10 a.m. and 10 p.m. EST, and pumping between 11 p.m. and 9 a.m. EST during weekdays and Saturdays. Limited generation would be expected on Sundays, and pumping would occur until the upper reservoir (Monticello) is filled. Under this operational mode, the upper reservoir elevation would vary between 425 and 420.5 feet approximately, except on Sundays and holidays when the fluctuation would be less.

Monticello reservoir would be constructed on the Frees Creek drainage, inundating about 70 percent of the creek's drainage area of about 9,800 acres, and it would have to be initially filled by pumping from Parr reservoir. 1.8 CONSTRUCTION SCHEDULES

The Applicant has proposed a construction schedule for the project (Figure 1-11) that would bring the first four units of the Fairfield pumped storage station on line 3-1/4 years after commencement of construction. The proposed pumped storage and nuclear-generating facilities are intended to meet future power needs which are projected by Staff to more than double (both energy load and maximum demand) by 1980 over the 1970 requirements, and double again by 1990. Figures 1-12, 1-13, and 1-14 show Applicant's expected peak load and capacity forecast from 1974 to 1982 and total load curves for peak weeks in 1976 and 1978.

## 1.9 RELOCATIONS

The Applicant's construction schedule shows that relocation of all residents'facilities and homes would occur during the second and third years of project construction. All necessary construction for highways and transmission lines would be completed prior to removing existing facilities from service.

Applicant has indicated it would pay relocatees fair appraised values for their property and make relocation reimbursements. Assistance would be given to the landowners in finding property. Homes that are sound would be physically moved to the new property if the homeowner desires, and the Applicant's representatives would also aid in handling payments to movers for relocation.

Surveying for project facilities was being conducted in November 1972, and the land acquisition program was moving forward rapidly. Clearing had not begun in the area. The Applicant has submitted a land management program and a biological monitoring program for carrying out the proposed action with the least possible environmental damage. Both programs are discussed in Section 4.

1.10 RECREATIONAL OPPORTUNITY CREATED BY THE PROJECT

The initial public recreational developments at the project would consist of the subimpoundment, two boat launching
	lst	Year	2nd	Year .	3rd	Year	4th	Yar	· Sth	Year	6ih	Year	]
	JFMAMJ	JASOND	JFMAMJ	JASON	7								
ACCESS & SITE PREPARATION									•			[	
POWER HOUSE								•					
COFFERDAM													]
EXCAVATION													
FIRST STAGE CONCRETE		C											]
SECOND STAGE CONCRETE				C									
TURBINE				C	1 2	3 4			56	78			
CRANE				:									
GENERATOR						2 3	4			6	8		
TRANSFORMER & SWITCHYARD	·			•						С			1
TRANSMISSION LINES													
DAMS													
CLEARING & HAUL ROADS													
DAMS A B B													
DAMS C & D													1
INTAKE STRUCTURE			·		·								
EXCAVATION					·		-	.			1		
STRUCTURES			ď				2		-		i		
PENSTOCKS											I		l
PARR BASCULE GATES									·				, .
CLEARING & RELOCATIONS									ŧ.				

Source: South Carolina Electric & Gas July, 1972 Revised Application

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Figure 1-11. Construction Schedule, Parr Project

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areas, and a scenic overlook.

Plans for the initial development of the 300-acre subimpoundment on the Monticello reservoir include a parking area for 10 cars with connected trailers, a 12-foot wide concrete boat ramp, a swimming area, and pit-type sanitary facilities. Gasoline-powered engines would be excluded from the subimpoundment.

The project boundary would be approximately 200 feet wide around the subimpoundment, to control access by the public and allow for expansion of facilities.

Plans for the boat launching area on Hellers Creek include parking for five cars with connected trailers, a paved ramp, and sanitary facilities.

The scenic overlook would contain an elevated, covered platform with two benches and a surrounding guardrail. Parking for 15 cars, 10 picnic tables, and sanitary facilities would be provided.

In addition, the Applicant stated in the revised application,filed July 26, 1972, that a visitor center and construction observation point would be built on the south shoreline of Monticello reservoir, overlooking the proposed Virgil C. Summer nuclear station site.

Initial annual usage at the proposed developments is estimated at 10,000 visitor-days, with an ultimate average annual visitation rate estimated at 100,000, assuming maximum development of facilities.



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 1.11 PROVISIONS FOR PUBLIC HEALTH AND SAFETY

Appropriate directional signs to the recreational facilities would be installed along local, State, and county roads. Identification signs would be located at the entrance to each public access area, indicating type and location of facilities, together with special use and occupancy rules as appropriate. Prior to the opening of a recreational facility, the public would be informed by notice in local newspapers.

All recreational facilities would be regularly maintained. Shrubs and brush would be trimmed back from the edge of hard-surfaced access and parking areas. Landscaping of exposed areas would be accomplished where appropriate. Periodic collections of trash would be made, and toilet facilities would be-maintained at regular intervals. Applicant has stated that waste disposal would be accomplished in accordance with applicable South Carolina Follution Control Authority standards. The Applicant would be responsible for operation and maintenance of the recreational facilities.

Pit-type sanitary facilities would be provided at all boat launching facilities and the scenic overlook. Applicant has stated that sanitary facilities would be constructed and maintained in compliance with all applicable requirements of the South Carolina Pollution Control Authority and the South Carolina State Department of Health. All pit-type toilet facilities would include a corrugated metal or plastic shelter, approximately 4 by 8 feet, with a partition dividing the facility. The shelter would include a fabricated metal toilet box with a hinged plastic seat. The shelter would be positioned on a reinforced concrete pad that would cover a concrete-lined pit of dimensions approximately 4 by 8 by 6 feet. The reinforced concrete pad would be fitted to facilitate cleaning.

The public would be excluded from certain areas within the project because of potential danger. These areas would include, but not be limited to,a 300-foot maximum approach distance to all points where intake or discharge structures exist on the Monticello impoundment shoreline, and are part of the operation of the Fairfield pumped storage facility or the Virgil C. Summer nuclear station. All restricted areas in Monticello reservoir would be marked with can buoys, bearing the standard inland waterways "No Boats Allowed" symbol. Also excluded from public use would be the tailrace of the Fairfield powerhouse, which would be marked by can buoys with the standard inland waterways "No Boats Allowed" symbol, and by signs on both ends of the Southern Railway Company trestle, facing Parr reservoir.

The area upstream of Parr powerhouse is already marked with 11 buoys, and 11 additional buoys would be added. All buoys would be made of hard, durable plastic. Each buoy would be anchored to two 250-pound concrete anchors by 50 feet of 7/16-inch galvanized guy wire. The Parr dam and Bascule gates would be flood-lighted at dark, and the tailrace of Parr powerhouse would be marked with warning signs.

Appropriate warning signs and maps would be located at all company boat landings, and the Applicant would be responsible for maintenance of the signs. All warning signs would be readable during daylight from a distance of 1,000 feet.

Reevaluation of the restricted areas for public use would be made after the project is in operation and during the biennial-review of the recreational needs of the area.

The proposed project boundary would include lands acquired for recreational development. Other lands needed for safe operation and maintenance of the project, and/or encompassed by nuclear exclusion zones superimposed on the Monticello impoundment, are shown as proposed by Applicant on Figure 1-1. The project boundary line would be precisely defined upon completion of field surveys presently being conducted.

1.12 COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS

The Applicant has filed its application for new license in general accordance with the Commission's Regulations under the Federal Power Act. Applicant has indicated intentions to comply with all other Federal, State, and local requirements.

The Applicant contacted the U. S. Army Corps of Engineers for a permit to dredge a tailrace channel for the proposed pumped storage powerhouse in Frees Creek at its confluence with Parr reservoir. The Corps informed the Applicant (letter dated August 19, 1971, Appendix A) that no dredging permit would be necessary under Section 10 of the Rivers and Harbors Act of 1899, since the Corps does not classify the Broad River as navigable above Columbia, South Carolina.

In accordance with the Federal Water Pollution Control Act Amendments of 1972 (33 USC §§1251-1376), the Applicant applied to the South Carolina Pollution Control Authority for a permit for dredging that would be required in the mouth of Frees Creek. This permit was granted by letter dated February 3, 1973 (Appendix A).

The Applicant applied to the South Carolina Pollution Control Authority for a Water Quality Certificate pursuant to Section 401 of the Federal Water Pollution Control Act Amendments of 1972, (33 USC \$1341). The certificate was granted by letter dated January 11, 1973 (Appendix A), stating that reasonable

assurance exists that the construction and operation of the Monticello impoundment and pumped storage facilities would not violate applicable water quality standards, assuming the operation of the 900-mw Unit I of the Virgil C. Summer nuclear station only.

Portions of South Carolina Highways Route 99 and Route 215 would be inundated by Monticello reservoir and portions of Newberry County Road 28 would be covered by raising Parr reservoir. According to Applicant, the South Carolina General Assembly enacted a bill on April 5, 1973, bearing Ratification Number R-248 and approved by the Governor on April 6, 1973, that would authorize the necessary closure, elevations, or relocations of South Carolina highways at the Applicant's expense and in accordance with agreements which have been made between the Applicant and the State and County highway departments.

Permits would be obtained from the South Carolina Highway Department for oversize, overweight, and overlength loads, and for required entrance roads on the State highway system.

Building permits for the construction of water quality monitoring stations on the Enoree, Tyger, and Broad Rivers have been obtained from Union County and are on file in the auditor's office in Union, South Carolina. A building permit for the construction of major project works would be obtained by the Applicant from the Fairfield County auditor's office several weeks prior to the commencement of construction.

A permit from the State Board of Health for the use of X-ray equipment for the testing of structural welds would be obtained when required.

The State Board of Health would be asked for authorization to use the 300-acre Monticello subimpoundment for swimming, after filling.

A memorandum of understanding (Appendix A) has been entered into between the Applicant and the South Carolina Wildlife and Marine Resources Department, to assure the continuous flow of water downstream from Parr powerhouse necessary for the survival, reproduction, and normal life-cycle activities of all species of fish, with particular regard to striped bass spawning during the months of March, April, and May.

Permits required for open burning would be obtained as necessary from the South Carolina Pollution Control Authority (Air Section) during the clearing operations.

The Applicant applied for a license from the Atomic Energy Commission (Docket No. 50-395) for authorization to construct, operate, and maintain Unit I of the Virgil C. Summer nuclear station on the proposed Monticello reservoir. The Atomic Energy Commission issued a construction permit to the Applicant on March 21, 1973.

The Applicant consulted the South Carolina Department of Archives and History concerning areas of historical significance. A reply dated June 1, 1972 (Appendix A) indicated that three sites existed in the area: Davis Plantation, Monticello Church, and Fonti Flora. Of these, only Davis Plantation is listed on the National Register of Historic Sites. The -effects of the proposed project on Davis Plantation and the local sites of historic interest are discussed in Section 2.

#### 2. DESCRIPTION OF THE EXISTING ENVIRONMENT

#### 2.1 POPULATION DENSITY

The nearest town is Newberry, South Carolina, (population 9,200), 16 miles to the west and the nearest large urban area is Columbia (population 113,500) 28 miles to the southeast. Approximately 681,000 people live within 50 air miles of the Parr project, and about 2,520,000 within 100 air miles. Fairfield County, in which the major portion of the new construction is proposed, had a 1970 population of 19,999 and an average density of 29 people per square mile. Newberry County's population for the same year was 29,273 with an average density of 46 people per square mile.

Table 2-1 shows the population of communities within a 30-mile radius of the site.

2.2 GEOLOGY AND PHYSICAL FEATURES

The Parr site lies within the southern part of the Piedmont physiographic province, a band of rolling topography of generally low relief lying south and east of the higher Appalachian Mountains and extending from central Mississippi to the west bank of the Hudson River in southern New York.

The Piedmont of South Carolina is bounded on the northwest by the Blue Ridge Mountains and on the southeast by the Fall Line and the Atlantic Coastal Plain. The land surface slopes from the crest of the Blue Ridge southeastward to the Atlantic Ocean, and all major streams flow southeastward down this slope.

# Table 2-1

# 1970 Population of Communities Within a 30-Mile Radius of the Site

COMMUNITY P	OPULATION	DISTANCE FROM SITE IN MILES	DIRECTION
COMMUNITYPPeakPomariaLittle MountainChapinSouth CongareeSummitGilbertLeesvilleLexingtonBatesburgProsperityNewberrySilverstreetJoannaWhitmireWinnsboro MillsRidgewayIrmoColumbiaPineridgeCayceSpringdaleArcadia LakesArdincapleBoyden ArborForest LakeCarlisleBaldwin-Argon MillsChesterEurekaWinnsboroGreat Falls	OPULATION 87 264 240 342 1,434 130 186 1,907 969 4,036 762 9,218 156 1,631 2,226 2,312 437 517 113,542 7,838 633 9,967 2,638 741 726 416 6,808 39 670 1,042 7,045 1,524 3,411 2,727	SITE IN MILES 4 6 9 9 29 26 26 28 22 30 14 17 22 30 22 15 22 15 22 16 26 26 29 27 27 27 28 28 29 27 27 27 27 27 27 27 27 27 27	DIRECTION S W SW S S S S S S S S S S S S S S S S

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Reference: 1970 Census of Population, South Carolina, U. S. Department of Commerce, Bureau of the Census.

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The bedrock within the Piedmont province is a complex of late Pre-Cambrian to middle Paleozoic metamorphosed sediments and intrusives. Among the metamorphosed group are slate, schist, gneiss, and granitelike rock known as migmatite. Intruded into the metamorphic rocks are younger crystalline rocks, generally granitic in composition. A geologic block diagram and section shown in Figures 2-1 and 2-2 illustrate the area.

The bedrock is mantled almost everywhere by a thick saprolitic soil, the in-site product of the decomposition of the underlying bedrock. The soil is of low fertility and best suited for forest and pasture.

The site lies within a forested area (oak, hickory, and pine) dotted by a few clearings for farms and dwellings. The topography is characterized by gently to steeply rolling hills and well-drained valleys. Branching from the gently winding course of the Broad River, the tributary streams form a trellis-dendritic system of high-gradient valleys in the adjacent upland. On the steeper slopes of the natural topography are deep gullies. Elevations above sea level within the Jenkinsville quadrangle, where the project is located, range from a low of 210 feet msl to a high of 481 feet msl, giving a maximum relief of 271 feet.

The waters of the area are relatively pure although high in suspended matter. The surface waters generally contain less than 100 ppm of dissolved salts, chiefly



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Source: South Carolina Electric & Gas July . 1972 Revised Application Figure 2-1. Diagrammatic View of Area Geology Perallel to the Broad River

SHOWN ON FIGURE 2- 20.



calcium and magnesium bicarbonates. The little utilized ground waters contain less than 1,000 ppm of dissolved salts. The sediment concentration in the streams is normally about 300 ppm.

Except for river sands and gravels, no mineral deposits of commercial value are known at the site, and there are no known commercial deposits of metallic ores. No deposits of fossil fuels are known, nor are any likely to be found in the crystalline basement rock beneath the site. A gravel quarrying operation is being carried on at Rocky Creek, approximately 10 miles upstream from Parr Dam.

2.3 CLIMATE

The climate of the project area is one of warm humid summers- and mild winters. The average air temperatures vary from about 45°F during the winter to about 80°F during the summer. The annual precipitation averages about 45 inches and monthly amounts vary from 2-1/2 inches in November to 6 inches in July. Severe droughts are rare, but floods are common and may occur during any month of the year. The types of severe weather which may affect the proposed project include tornadoes, hurricanes with a frequency of about one every two years, and thunderstorms in about 54 days per year. The prevailing winds for both annual and stable conditions are from the western sector.

#### 2.4 WATER QUALITY

Approximately 4,750 square miles of the entire watershed extending northwest into North Carolina are drained by the Broad River at the project site. The average annual runoff at Parr dam is about 4.3 million acre-feet, creating an average annual flow of 6,100 cfs. The largest flood of record, 228,000 cfs on October 3, 1929, was recorded at the Richtex gage 11 miles downstream of Parr dam. The lowest instantaneous flow measured at Richtex was 105 cfs, and the lowest average daily flow was 149 cfs. Ninety-five percent of the time the 7-day lowflow exceeds 700 cfs. The lowest average monthly flows for a 40-year record occurred in June, July, September, and November.

The existing Parr hydroelectric project operates as a run-of-the-river plant with outflow from the Parr reservoir being equal to inflow minus evaporation.

Streamflow from Frees Creek into the Broad River has not been measured, but runoff is roughly proportional to the size of the drainage basins. Frees Creek has a ratio of about 17 square miles to about 4,500 square miles for the Broad River at the point of confluence, or about 0.4 percent of the Broad River flow.

The Broad River in the vicinity of the project site is about 2,000 feet wide and ranges in depth from a few feet to around 15 feet. During normal flow, several islands appear in the reservoir; shallow depths are due largely to siltation.

Chemical analyses indicate that the water is low in alkalinity and total dissolved solids and that there is little variability in water quality with discharge rate. Water quality data from three locations upstream of the Parr dam are given in Table 2-2.

Dissolved oxygen is normally high and near saturation. No dissolved oxygen problems have been reported downstream of the Parr dam. Water temperatures range from the low forties in the winter to the low eighties (°F) in the summer.

Heavy metal determinations have been made by the South Carolina Department of Health and Environmental Control in the vicinity of the Parr Reservoir (Table 2-3). Heavy metal accumulation is caused by settling of soil or silt particles to which heavy metals are adhering and settling of dead plantonic organisms in which these heavy metals may concentrate. Heavy metals as well as other chemical constituents in the water can be expected to accumulate to some extent in the sediments, with the exception of that amount remaining in solution. Concentration of mercury, copper and cadmium are below levels found to be toxic to some aquatic organisms, but chromumium and lead approach levels that could be harmful. <u>60</u>/ Much research has been done on heavy metal toxicity to aquatic organism; however, no toxic levels have been specified that

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# Table 2-2

Chemical Water Analysis of Broad River Study Area, Parr, South Carolina, March 4, 1971

Tests	Station 2	Station 3	Station 4
Total Dissolved Solids, at 105°C	47	45	45
Total Hardness, as CaCO <sub>3</sub>	42	42	42
Calcium Hardness, as CaCO <sub>3</sub>	24	30	18
Magnesium Hardness, as CaC03	18	12	24
Calcium, as Ca	9.6	. 12	7.2
Magnesium, as Mg	4.4	2.9	5.8
Alkalinity (Phenolphthalein), as CaC03	0	0	0
Alkalinity (Total), as CaC03	36	. 36	36
Carbonate Alkalinity, as CaC03	0	0	0
Bicarbonate Alkalinity, as CaC03	36	36	36
Hydroxides, as OH	Ó	0	0
Carbon Dioxide, as C0 <sub>2</sub>	-	18	54
Carbonates, as CO3	0	0	0
Bicarbonates, as HC03	44	.44	44
Chlorides, as Cl	0	0	0
Iron, as Fe	5.5	4.8	4.5
Manganese, as Mn	0	· · 0	0
Sulfate, as SO4	1	1	1 .
Fluorides, as F	0	C.	0
Silica, as SiO <sub>2</sub>	10	.11	11
Copper, as Cu	0	ο	0
Phosphate (total), as P04	1.5	1.2	1.2

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Color, Standard Platinum Cobalt Scale		45	40	40
Odor		0	0	0
pH (Laboratory)		4.8	6.6	6.1
Turbidity, Silica Scale		500	360	400
Total Nitrogen		2.73	2.50	2.57
Ammonia Nitrogen		1.00	0.82	0.82
Organic Nitrogen		1.73	1.68	1.75
N0 <sub>3</sub> + N0 <sub>2</sub> - Nitrogen		0.30	0.28	0.26
NO <sub>2</sub> - Nitrogen	•	0.10	0.05	0.05
N0 <sub>3</sub> - Nitrogen	j	0.20	0.23	0.21
Total Phosphorus (P0 <sub>4</sub> -P)	;	0.27	0.27	0.25
Ortho Phosphorus (P04-P)		0.21	0.20	0.21
Total P - Filtered		-	-	-
Ortho P - Filtered		<b>-</b> '	-	-
COD		15	21	21

Table 2-2 (Cont'd.)

Source: South Carolina Electric & Gas - Environmental Report Supplement I- Virgil C. Summer Nuclear Station ÷.

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## TABLE 2-3

## TOTAL CONCENTRATION OF CERTAIN HEAVY METALS ABOVE AND BELOW PARR RESERVOIR

L	Above Par	rr Reservoir	S.C. Highway	34)	
Sampling Period	Cu (mg/1)	Cr (mg/1)	Pb (mg/1)	Hg (mg/1)	[Cd (mg/1)
8/28/62	Min. 0.050 Avg. 0.050	Min. 0.100 Avg. 0.234	Min. 0.100 Avg. 0.157	Min. 0.0002 Avg. 0.0004	Min. 0.005 Avg. 0.059
12/7/73	Max. 0.050	Max. 0.480	Max. 0.200	Max. 0.0005	Max. 0.100

	Below Parr	Reservoir (S.C	C. Highway #21	3)	
Sampling Period	Cu (mg/1)	Cr (mg/1)	Pb (mg/1)	Hg (mg/1)	Cd (mg/1)
6/25/70 12/7/73	Min. 0.050 Avg. 0.055 Max. 0.070	Min. 0.100 Avg. 0.358 Max. 1.090	Min. 0.034 Avg. 0.349 Max. 1.210	Min. 0.0000 Avg. 0.0003 Max. 0.0005	Min. 0.005 Avg. 0.056 Max. 0.100

Source: South Carolina Department of Health and Environmental Control

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would apply to all fresh water; therefore, each case of suspected heavy metal concentration should be evaluated individually. Toxicity of heavy metals varies widely with such factors as organism involved, temperature, dissolved oxygen, pH, valence of the metal, concentrations of other heavy metals, and resulting synergism and hardness of the water. No reported instances of mortality to aquatic organisms from heavy metals in the Broad River are known to Staff. Applicant has indicated that heavy metals determination will be included in its monitoring program, and Staff has included this as a recommendation in Section 10.

The Broad River is designated Class B water4/, and standards for this designation are given in Table 2-4.

Groundwater 5/ in the region occurs in two types of formations: (1) jointed and fractured crystalline bedrock, and (2) the lower zones in the residual soil overburden. Recharge to these formations is by infiltration of precipitation in the upland areas. Some of the water infiltrating the surface soils evaporates, transpires from plants, or reemerges at the surface downslope at short distances from points of infiltration. A small portion of the water percolates to perched water zones in the lower soils and into the water table in the underlying jointed bedrock.

The groundwater table follows the land surface but with more subdued relief, discharging as visible seeps and springs and/or percolating through the ground into creeks and streams. Some groundwater is discharged via wells, but the amount pumped is very small because the formations generally are not pervious enough to sustain well yields greater than 5 to 10 gallons per minute.

The overburden soils release water slowly to the lower, more pervious units. As a result of this storage effect, yields of wells and flows of springs remain rather constant and are sustained during periods of deficient moisture.

Use of groundwater in the region is principally for households and livestock. Within 20 to 30 miles of the site, approximately 55 wells are used for municipal and industrial purposes. Wells in the region are commonly less than 200 feet deep and yield about 10 gpm or less. The only nearby public water supply is a well field at Jenkinsville, about 3 miles southeast of the site. It is understood that a surface water supply is being planned for this community.

The quality of groundwater at 200 feet below the surface in the region is satisfactory for most industrial and domestic purposes. The water is low in dissolved solids but high in iron.

Parr steam plant, located near Parr dam, uses water from Parr reservoir for cooling and discharges it back into the reservoir. The maximum temperature rise over the condensers is 15°F, with a maximum cooling water flow of 207 cfs. Temperatures reaching 92°F have been recorded at the intake at Parr steam plant. This is due, however, to intake and outlet structures located in such a manner that recirculation occurs at the intake. The maximum temperatures over most of Parr reservoir are between 80° and 90°F.

The persistant turbidity of the Broad River is due to the type of soils occurring in the watershed. These soils are mainly clays and silts which erode readily. Secchi disc readings in the turbid waters reportedly range from 6 to 21 inches. These readings indicate a very high to moderately high turbidity that reduces the penetration of sunlight to a very limited depth and consequently adversely affects the biological productivity of the Broad River and Parr reservoir. The deposition of sand and silt associated with high turbidities renders the substrate unsuitable for habitation by benthic organisms, <u>6</u>/ and this also adversely affects the biological carrying capacity of the reservoir.

Since the spring of 1969 the Columbia, South Carolina, water treatment plant which takes its drinking water supply from the Broad River, some 6 to 8 hours flow time downstream from the Parr Reservoir has experienced taste and odor problems. During the spring of 1972, personnel from the Surveillance and Analysis Division of Region IV of the U. S. Environmental Protection Agency conducted an investigation for the South Carolina Pollution Control Authority to determine the source and cause of these taste and odor problems. Results of the study were published by EPA under the title, "The Relationship between Substrate Content, Water Quality Actinomycetes, and Musty Odors in the Broad River System." Conclusions and recommendations from this study are included in Appendix E.

2.5 CURRENT LAND USE

Land within 50 air miles of the site is relatively uniform with forests covering 50 to 80 percent in the counties within that radius. Fairfield county, in which the major portion of the project would be located, is about 80 percent forested, 13 percent agricultural, three percent urban and suburban, and four percent in other miscellaneous uses. Tables 2-5 and 2-6 show existing land use in the site vicinity (10-mile radius) and region (50-mile radius). Table 2-7 presents agricultural data and cash returns from the farms in Fairfield and Newberry Counties.

## Table 2-5

Land Use	Fai	rfield	County	Newberry County		County	Two-Co	unty Averages
	1958	1967	Change 1958-67	1958	1967	Change 1958-1967	1967	Change 1958-1967
	(%)	(%)	(%)	(8)	(%)	(%)	(%)	(%)
Federal Land	2.7	2.7	0	13.6	13.6	0	8.2	0
Urban and Built-Up	1.3	2.8	+1.5	4.4	4.5	+0.1	3.6	+0.8
Cropland	11.2	6.0	-5.2	19.9	12.4	-7.4	9.2	-6.3
Pasture	7.5	7.1	-0.4	4.3	8.8	+4.5	7.9	+2.0
Agricultural (Cropland Plus Pasture)	18.7	13.1	-5.6	24.1	21.2	-2.9	17.1	-4.3
Forest Land	75.5	80.0	+4.5	55.1	58.3	+3.2	69.1	+3.8
Other Land	1.7	0.9	-0.8	2,5	2.1	-0.4	1.5	-0.6

## Land Use in Vicinity of the Project

NOTES:

The area within 10 miles of the site is principally located within two counties: about two-thirds in Fairfield County, one-third in Newberry County. 1.

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Reference: "South Carolina Soil and Water Conservation Needs Inventory," May, 1970. 2.

Table	2-6	
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# Land Use in the Region

		Chester	Fairfield	Greenwood	Kershaw	Lancaster	Laurens
Total County Land (1	Acres)	374,000	447,000	286,000	503,000	323,000	449,000
Federal Land (%)	1958 1967	3.2 3.2	2.7 2.7	3.5 3.5	0 0	0	4.5
Urban and Suburban	(%)1958 1967 ·	4.3 4.2	1.3 2.8	5.2 6.3	2.1 2.9	2.3 9.3	3.9 5.4
Cropland (%)	1958 1967	15.2 13.0	11.2 6.0	17.9 11.2	19.1 13.0	16.9 10.0	24.2 15.0
Pasture (%)	1958 1967	12.1	7.5 7.1	10.8 14.1	2.0 3.2	5.4 6.6	9.4 11.1
Agricultural (Crop- land plus Pasture) (%)	1958 1967	17.6 24.2	18.7 13.1	28.7 25.3	21.1 16.2	25.3 16.6	23.6 26.1
Forest (%)	1958 1967	61.7 66.6	75.5 80.0	60.0 65.0	72 79.5	66.9 69.3	54.7 61.2
Other Land (%)	1968 1967	3.5 1.8	1.7 0.9	2.1 1.4	3.9 2.9	7.4 3.7	3.1 2.4

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# Table 2-6 (Cont.)

Land Use in the Region

	••••••••••••••••••••••••••••••••••••••	Lexington	Newberry	Richland	Saluda	Union	York	Average
Total County Land (Ad	cres)	455,040	405,120	479,000	283,000	330,000	438,000	Area
Federal Land (%)	1958 1967	0 0	13.6 13.6	11.5 11.5	1.4 1.7	17.0 17.0 Percent	0.7 0.7 Change	3.9 3.9 0
Urban and Built-Up (	8)1958 1967	6.9 10.5	4.4 4.5	10.2 17.6	0.8 1.2	2.7 3.2 Percent	6.0 9.2 Change	4.2 6.4 +2.2
Cropland (%)	1958 1967	22.6 21.1	19.8 12.4	15.6 13.1	25.2 19.5	12.0 7.6 Percent	21.2 15.3 Change	18.4 13.1 -5.3
Pasture (%)	1958 1967	2.7 3.5	4.3 8.8	3.5 2.9	11.8 17.3	6.5 9.4 Percent	10.4 11.8 Change	7.2 8.9 +1.7
Agricultural (Crop- land plus Pasture) (%)	1958 1967	25.3 24.6	24.1 21.2	19.1 16.0	37.0 36.8	18.5 17.0 Percent	31.6 27.1 Change	24.2 22.0 -2.2
Forest (%)	1958 1967	64.3 61.8	55.1 58.3	56.1 52.7	57.6 57.0	55.6 61.2 Percent	55.7 58.0 Change	61.3 64.2 +2.9
Other Land (%)	1958 1967	2.8 2.4	2.5 2.1	2.7 0.7	2.8 2.8	6.1 1.5 Percent	4.8 3.5 Change	3.6 2.2 -1.4

Notes:

1. The area within 50 miles of the site takes in all or parts of the twelve counties listed in this Table.

2. Reference: South Carolina Soil and Water Conservation Needs Inventory, May, 1970.

Source: South Carolina Electric & Gas, July 1972 Revised Application.

## Table 2-7

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Agricultural Data, Farms, Acreage, and Value, 1964 1/

ITEM	FAIRFIELD COUNTY	NEWBERRY COUNTY
Number of Farms	455	1,018
Average Size of Farms (Acres)	278	179
Average Value Per Acre (Dollars)	109	117
CASH RECEIPTS F	ROM FARM MARKETINGS - 1969 2/	
(Percent of Total 1969	County Cash Receipts/Rank in	State)
ITEM	FAIRFIELD COUNTY	NEWBERRY COUNTY
Cotton and Cotton Seed	1.3/40th in 46	0.4/38th in 46
Soybeans		4.6/24
Oats		0.4/9
Wheat	0.8/31	0.6/19
Other Crops <u>3</u> /	4.0/38	1.7/25
Forest Products <u>4</u> /	24.3/3	3.2/5
Dairy Products	16.4/29	29.0/2
Cattle and Calves	33.7/27	13.1/7
liogs	4.8/45	5.6/18
Eggs	8.6/45	29.6/1
Other Livestock and Livestock Products 5/	6.1	11.8

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LIVESTOCK AND POULTRY S	TATISTICS - 1969 6/	
SPECIES AND CLASS	FAIRFIELD COUNTY	NEWBERRY COUNTY
All Cattle All Beef Cattle All Milk Cows Beef Cows 2 yrs. and Over Hogs All Chickens Egg Production (1968)	9,500 head 8,500 head 750 head 5,200 head 900 head 27,000 head	22,300 head 13,400 head 6,200 head 6,800 head 9,000 head 470,000 head
Avg. Number of Layers During year Total Eggs Produced Milk Production (1968) Avg. Number of Cows Milked During year Total Milk Produced	22,000 head 4,700,000 700 4,000,000 lbs.	353,000 head 81,200,000 6,100 43,000,000 lbs.

Table 2-7 (Cont.)

#### NOTES:

- 1. Reference: 1964 United States Census of Agriculture
- 2. Reference: South Carolina Cash Receipts From Farm Marketing, September, 1970.
- 3. Includes nursery and greenhouse products, peanuts, hay crops, seed crops, other miscellaneous crops, fruits and nuts except peaches.
- 4. Relates only to sales from 1964 census defined farms.
- 5. Includes farm chickens, turkeys, turkey eggs, other poultry, honey, beeswax, sheep, lambs, wool, horses, mules.
- 6. Reference: South Carolina Livestock and Poultry Statistics, June, 1969.
- 7. Cows and heifers two years old and over kept for milk. Includes two-year old heifers not yet fresh.

Source: South Carolina Electric & Gas July, 1972 Revised Application

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A 40-year land use projection for the site vicinity (all land within a 10-mile radius of the proposed project) estimates that 85 percent of the land will be used for forestry, 10 percent for urban and built-up area, and 5 percent for agricultural and other uses.

State and regional planning authorities have developed no long range comprehensive county or regional plans, but general plans concerning water supply and recreation have been developed. For example, the Fairfield County water and sewerage plan includes improvements in domestic water supply in the Jenkinsville-Monticello area. The U. S. Forest Service has long-range plans for recreational development in its Broad River Management Area, upstream of the existing Parr reservoir. Fairfield and Newberry Counties have at present no zoning or land use regulations in the site vicinity.

Other than a small plastics processing plant in Jenkinsville about 3 miles southeast of the site, there are no industrial developments in the site vicinity. Local residents find employment in industries located in the Columbia area, 26 miles to the southeast, and in Winnsboro, 15 miles northeast. Forestry is the only industry of commercial importance in the area and the major commercial resource that would be affected by the proposed project.

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Fairfield County was the most heavily forested county in the State in 1967, with the majority of the forest land privately owned. Approximately 76,200 acres within the county are owned by 5 major pulp and paper companies, and Sumter National Forest occupies another 12,100 acres in the northwest section of the county. Several forestryrelated industries operating in the county include saw mills, planing mills, and pulpwood dealers. Since 1958, the size of the county's forest industry has increased considerably. The volume of softwood, particularly pines, has shown a substantial increase, but the volume of hardwood has decreased. Efforts are presently being made to encourage quality hardwood species in the limited suitable lands available. The dominant trees in the area are pines on the uplands and mixed hardwoods in the stream bottom The creation of Monticello reservoir will inundate lands. about 3,000 acres of mixed pine and hardwood bottom lands, another 3,000 acres of pine plantation, and about 300 acres of Sumter National Forest.

Agriculture in the vicinity of the site is neither a major land use nor source of income and has declined to 17 percent of total land use in Fairfield and Newberry Counties. Besides the decline in farmland in the region, there has also been a substantial change in farm enterprises from intertilled crops such as cotton to livestock and poultry. Due to the low fertility and high erodibility of the soils, few of the farms are economically viable, with most of the cleared land being in pasture or idle. Most of the farms are owned by part-time farmers who work in nonagricultural industries in the area. The families that could be displaced by the project are primarily using their lands for small scale crop production and small woodlot operations. 2.6 TRANSPORTATION CORRIDORS

State Route 215 is the nearest highway to the proposed project and would be the only one of some importance to be affected. County Route 99, carrying a low volume of local traffic, would be completely relocated in the project area. Interstate 26, running in a northwest-southeast direction, is approximately 5 miles southwest of Parr dam at the nearest point. Figure 1-1 shows highways adjacent to the project.

Three of Applicant's transmission line corridors lead from the Parr hydroelectric plant and the Parr steam plant, but none of them would be affected by the project. A 100-kv transmission line owned by Duke Power Company crosses the proposed Monticello reservoir and would have to be relocated.

Southern Railway has a one-track right-of-way along the east bank of the Broad River. The raising of Parr reservoir level and excavations in Frees Creek for the

Fairfield pumped storage plant tailrace would necessitate relocating and raising a portion of the tracks and building a 1,000-foot trestle. This line does not receive heavy use presently, and rail traffic would be disrupted for about 12 to 30 months by the project.

The Columbia Airport is located approximately 25 miles southeast of Parr dam. The project is expected to have no effect on the air corridors into the airport. 2.7 EMPLOYMENT AND ECONOMY OF THE AREA

The economy and population of Newberry and Fairfield Counties are typical of rural South Carolina. Agriculture has declined considerably in the area since the 1930's, accompanied by a rise in importance of industries such as textile mills, furniture factories, and chemical industries. The location of these industries in the larger urban centers has resulted in migration from rural areas (such as the project area) to the cities.

The 1970 income per capita was \$1,642 for Fairfield County, \$2,284 for Newberry County, and \$2,313 for South Carolina, as compared to the national per capita figure of \$3,139 for the same period.

2.8 FISH AND WILDLIFE

A checklist of flora and fauna whose range includes the area of Parr hydro project has been prepared by Staff and is attached (Appendix B); however, not all species listed occur within the project site. A vegetative cover map of the project area is attached as Appendix H.
The persistent turbidity of the Broad River places a limit on the river's fish carrying capacity (pounds of fish per acre). Since turbidity restricts sunlight penetration, periphyton (attached algae) are not able to build suitable populations to support a large biomass. Furthermore, settling out of suspended particles reduces the amount of suitable habitat for benthic organisms.

The Broad River within the project supports a limited warm water sport fishery. Principal species sought by anglers include catfish, largemouth bass, and sunfish with catfish the most intensively fished. Other species within the project area can be characterized as "rough fish," undesirable to fishermen, but important links in the food chain of the predators. Four basic aquatic habitats are represented within the proposed project area: free flowing Broad River, Parr Reservoir, embayments within Parr Reservoir, and Frees Creek (Appendix D).

Rabbit, squirrel, quail, and dove are the primary game species found within the project area. White-tailed deer, the most important big game species in South Carolina, is found here; however, it is presently not considered to be abundant within the project area. <u>59</u>/ Occasional sightings of wild turkey have been reported for the project area and

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have been attributed to an expansion of its range from adjacent National Forest lands where it was reintroduced in the early 1950's.<u>59</u>/ Waterfowl have historically used the Broad River as a migratory flyway and meeting area. Several species of ducks have been reported as transient; however, only the wood duck is considered to be a resident species. The Broad River is one of the major wood duck production areas in the Piedmont system. Other wildlife in the area includes various mammals, birds, reptiles, amphibians, and numerous macro- and micro-invertebrates. Although of 'apparently little direct sport or commercial value, these organisms form a necessary part of the ecological community.

The proposed facility would be located in an area dominated by pine plantations. Historically, this region was cleared of its native vegetation to allow the production of cotton in the uplands and corn and grain in the lowlands. The area suffered greatly with the advent of the boll weevil, and during the depression years farmers largely abandoned the area.

In the early 1930's, programs of the Civilian Conservation Corps and Works Progress Administration provided the manpower and the means to plant badly eroded areas with pines. Private

paper companies continue to clear existing vegetation and establish pine plantations. The dominant species is loblolly pine and is found primarily on the slopes and uplands in the project area. Other upland species include white and red oak and hickory. Very little understory vegetation is present because of the shading effect of the deciduous trees. The pines provide some soil protection and cover, but they produce very little food for deer and other wildlife species.

The bottomlands are inhabited by cottonwood, sweetgum, Nuttall oak, willow oak, and white ash. Honeysuckle and greenbriar are important ground cover species. Bottom land vegetation provides necessary nesting, roosting, shelter, and food for many wildlife species. The honeysuckle, found almost exclusively in the lowlands, provides the primary food source for the deer population. According to South Carolina game biologists, the lush growth and nutrient value of honeysuckle has a direct influence on the excellent growth rates and physical condition of the deer. Acorns provide another major source of food for wildlife. Smartweed, an excellent waterfowl food, is also quite abundant in the bottom land. A terrestrial monitoring program has been initiated to establish a more complete baseline inventory (Appendix D).

One southern bald eagle was spotted in the project area during a migration season by Applicant's consultants, but no evidence of nests has been discovered. No other rare or endangered plant or animal species is known to occur within the project area.

2.9 EXISTING RECREATION

There are no developed recreational facilities at the existing Parr reservoir, although fishing and waterfowl hunting are a recreational use.

The "consumptive" wildlife on the project area includes such game birds as bobwhite quail, mourning dove, and turkey, and such mammals as squirrel, cottontail rabbit, and white-tailed deer. The population of each species is low and hunting is probably only by local residents. However, no harvest information is available for the project area.

The project area is in the Central Piedmont Hunt Unit (South Carolina Wildlife and Marine Resources Department) where 2,135 deer were harvested before November 20, 1973, and 2,452 deer were killed during the entire 1972 hunting season. A record harvest occurred in 1972 and the harvest was expected to be even higher by the end of the 1973 hunting season.

Based on the habitat available and the observation of deer and signs of deer, the populations within the project area are considered low. The number of deer that were probably harvested in the project area is estimated by the Applicant at less than six.

The Central Piedmont, with 552,156 acres, reported 92 gobblers harvested during the 1973 spring season, compared to 72 gobblers harvested in 1972. Very few, if any, were probably harvested in the project area. The area of Frees Creek and the Broad River is believed to be good to excellent turkey range within the Central Piedmont, according to a South Carolina Wildlife Resources Department District Biologist. However, the seasonal abundance of the wild turkey in the Frees Creek area and/or the Central Piedmont Hunt Unit has not been estimated. Turkey that presently occur within the Frees Creek area are "spill-over" from adjacent National Forest Land where re-introduction of turkey took place during 1953-1956. This "spillover" is fairly recent and accounts for occasional sightings of single turkeys, as well as small flocks in the project area.

Although there is potential non-consumptive recreational use of wildlife on project lands, it has not been realized. The major reason appears to be that this area is not unique within the Piedmont. New transmission line rights-of-way could enhance habitat for both consumptive and non-consumptive wildlife, and, therefore, provide greater recreational use.

Consumptive recreational use of aquatic resources involves the catching of fish, frogs, turtles, or invertebrates from Parr Reservoir, the Broad River within the zone to be inundated, and Frees Creek. Presently there are no quantitative data available to estimate fisherman-use of the area. Observations by field crews have not revealed any heavy usage of Parr Reservoir either by boat or bank fishermen. Access is difficult at most places on the bank, and the muddy waters, as well as the better fishing in other lakes, tends to limit the use of the reservoir. At no time during survey operations by the Applicant were more than 10-20 fishermen seen in any day at the reservoir during the prime fishing seasons (spring, early summer and fall). During non-prime seasons, 0-10 fishermen utilized the reservoir. Consumptive use of Frees Creek aquatic life is not known but would have to be slight, since it supports only small fish and the creek itself does not serve as a spawning area for larger fish. Presently, little is known of the consumptive use of the Broad River in the zone which will be inundated. The river as a whole, however, is not noted for good fishing.

Non-consumptive recreational use of aquatic organisms would involve observation of fish and invertebrates informally during picnics or other outings, or at specific times when

unusual movements (spawning) or other activities of aquatic organisms make them especially interesting to the public. Based on observations during field sampling, these uses are very low to non-existant in the site area. The turbid nature of the waters for much of the year, the relative lack of access to the water, the lack of use of the area as a picnicking or camping area, and the lack of interesting visible activities of aquatic life serve to make this area undesirable for non-consumptive uses.

Various parks and other recreational areas are within the region, but the only significant public land available for recreational use within a 10-mile radius is the Enoree Division of the Sumter National Forest. Here, picnicking, hiking, hunting, and limited boating and fishing occur. One boat ramp on nearby Cannons Creek serves the immediate vicinity of the Parr reservoir.

2.10 SCENIC, NATURAL, AND HISTORIC VALUES

A large portion of the land in the vicinity of the upper reservoir is covered with loblolly pines of varying ages. Most of the roadside scenery is pines, which occur both in plantations and as part of the natural succession in the abandoned fields and pastures of the area. State Route 215, running generally along the ridge top at the eastern

edge of the proposed upper reservoir, is essentially a narrow corridor with pine walls. This view is broken occasionally by small communities (two or three houses), and fields and pastures. At the town of Monticello, the view broadens considerably, due to the pastures around Davis plantation. Most of the proposed upper reservoir and the hills and saddles (sites of dikes) that would form the western edge of the proposed reservoir can be seen from this vantage point.

Figure 2-3 shows the historic sites near Monticello reservoir. Davis Plantation, located about a quarter of a mile south of Monticello on Route 215, is the only registered national historic site that would be affected by the project. The white wooden frame structure, with tall columns and a pecan and oak-lined drive in front, is well kept and still in use. The area around it is mainly in cattle pasture and some of these lands would be flooded. Staff, pursuant to Section 106 of the Historic Preservation Act, consulted the National Register of Historic Sites and afforded the Advisory Council on Historic Preservation opportunity to comment on the DEIS.



Figure 2-3. Locations of Historical Sites Near Monticello Reservoir •

There is a small, picturesque Methodist Church, approached by a wooded lane, at the southern edge of Monticello on Route 215; this church is of some local historical value and is on the State historic list. An old graveyard on the southern side of the church looks out across a pasture over the proposed reservoir area, but it will not be inundated. Fonti Flora, another State Historic site (not shown on the map) will not be affected. Although not a national or State historic site, the White Hall African Methodist-Episcopal Church, established in 1867, will have some lands flooded by the project.

Historically, the lower settlement of the Great Cherokee Nation extended to the Broad River, and the area between the Broad and Catawba Rivers was a common hunting ground for the Cherokee and Catawba tribes.  $\underline{7}$ / Four archaeological sites associated with Indian habitation have been identified, none of which would be inundated. The State Archaelogist has recommended that two of the sites be excavated, and prior to construction a detailed survey of the area be conducted to determine whether additional sites exist, and, if so, to determine whether detailed excavation and analysis are warranted.

The Applicant has stated that it will support and finance such a study to be conducted by the University of South Carolina Institute of Archaeology and Anthropology.

## 3. ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

The primary benefit derived from the proposed project would be the production of peak electric energy in the Applicant's system to serve the growing power needs of the public. Also, the upper pumped storage pool, Monticello reservoir, would provide cooling water for the proposed Virgil C. Summer nuclear station. Thus, the combined projects (nuclear and pumped storage) would serve both base load and peaking power needs.

The proposed recreational facilities would be the first in Fairfield County and would provide increased outdoor activities, including harvest of possibly enlarged sport fish populations due to construction and management of the subimpoundment.

Sport fishing in Parr reservoir would probably be curtailed or fishing success decreased by the almost 10-foot daily fluctuation resulting from pumped-storage operations.

The quality of the existing fishery in Parr reservoir and Broad River is classed as very poor due to turbidity. The recreational fishing provided by the proposed subimpoundment on Monticello reservoir should offset any losses to the fishing in Parr reservoir.

In the project area, following issuance of a license for construction and operation of the project, increased job opportunities would arise, and there would be an expanded tax base providing additional economic gains.

3.1 HUMAN ELEMENTS

The greatest impact on the communities of the area would result from the influx of the construction work force. Approximately 600 workers would be employed at the pumped storage project and about 1,200 workers at the atomic plant site.  $\underline{8}/$ 

A study of similar construction projects has shown that an influx of 1,800 workers into such an area results in a population increase of 5,110 people, including 1,000 school children, and requires about 700 mobile home accommodations. 9/

Of the 1,800 workers for the two projects, approximately 30 percent would come from permanent residents within a 25-mile radius of the project area. <u>10</u>/ The majority of those workers relocating in the project area would probably settle in Columbia, South Carolina. <u>11</u>/ The number of workers actually locating in the project vicinity should be relatively small, and the local area service facilities should absorb the increased load without any great difficulty.

Population increase resulting from the project should occur gradually, building up to a peak and tapering off during the construction period. A small permanent increase would result from the professional and skilled workers required for the operation of the pumped storage plant and the nuclear station.

The commuting workers, heavy construction equipment, and trucks transporting construction materials would probably damage the relatively light duty roads of the area. However, no estimate of the increased maintenance costs is available. The increased traffic could cause some inconvenience to, and increase the driving hazards for, local residents using the roads.

The major adverse impact on the human resources of the area would result from the relocation of as many as 25 families (9 by the nuclear station), 5 small abandoned cemeteries, and portions of State Route 215 and County Route 99. The enlargement of Parr Reservoir would require the elevation of sections of Newberry County Road 28 and of a section of railroad track over Frees Creek. Relocation of the homes, cemeteries, and roads would be required by inundation of the 6,800 acres of land by the upper reservoir. Raising the elevation of the existing Parr reservoir and excavations in Frees Creek area

would require the relocation of a short section of the Southern Railroad tracks.

The total land area to be acquired or controlled by the Applicant for both the proposed Fairfield pumped storage facility and the Virgil C. Summer nuclear station would involve approximately 11,000 acres. This would include both inundated lands and lands required for buildings, access roads, the nuclear safety exclusion zone, and other project elements.

Construction of the combined projects as proposed would result in the loss of about 700 acres of agricultural land in the areas of the upper reservoir and the nuclear station, and a few small cleared tracts in the Broad River bottomlands. <u>12</u>/ Most of these lands are either in pasture or are not currently planted in crops. Due to long overuse and to high erodibility, the land in this area is generally not suitable for intertilled crops. Agriculture in the site vicinity is not a major source of income, having decreased in Fairfield and Newberry Counties by 4 percent of the land area within the last decade. Agricultural data for these two counties are given in Tables 2-6 and 2-7.

Inundation of land by creation of the upper reservoir would result in the loss of about 3,000 acres of pine plantations and about 3,000 acres of mixed pine and bottom land hardwoods.

About 2,550 acres of bottomland hardwoods would be lost by the flooding of new lands in Parr reservoir. Approximately 300 acres of national forest that have been used as waterfowl management area would be lost. The total loss of forested lands (8,550 acres) would represent a decrease of about 1.4 percent of the total forested lands in Fairfield and Newberry Counties. The pine forests in Fairfield County that would be lost have commercial value as timber and pulp. The bottomland hardwood trees around the Parr reservoir are primarily important in providing wildlife cover and food, and have secondary value as timber.

Sand and gravel deposits in the Broad River would be lost. An existing quarrying operation on Rocky Creek, about 10 miles upstream from the existing Parr Dam, would not be affected, however, because the present quarry site would be above the Parr Reservoir's proposed maximum elevation of 266 feet msl. Any expansion of the quarry further downstream could be hampered by the proposed project, although the rise in water levels at the Rocky Creek and Broad River confluence would be only 4 or 5 feet.

3.2 FISH AND WILDLIFE

The U. S. Fish and Wildlife Service lists the following species as endangered in South Carolina: American alligator, eastern brown pelican, southern bald eagle, Eskimo curlew, American ivory-billed woodpecker, and Bachman's warbler. However, none of these species is

known to nest or reside within the project area.....

One of the most significant impacts on the existing terrestrial biota would result from the inundation of about 2,550 acres of bottomlands due to enlargement of Parr reservoir. These bottomlands along the river provide habitat and produce food for many species of wildlife both on and beyond the 2,550 acres. The loss will adversely affect the existing wildlife resources to an undetermined degree. If these habitat and food producing areas are flooded, the animals would migrate to adjacent land This migration would place an added strain on the areas. habitat of the wildlife species resident in these areas, thereby disturbing an existing balanced ecosystem. In areas with populations below the carrying capacity of the land, these displaced species might be absorbed without having any significant impact on resident species. On those lands becoming overpopulated, the habitat would suffer from overuse until the surplus populations are harvested by hunters, die from disease or starvation, or move into areas where they can be sustained by the habitat. The creation of the upper reservoir would involve the inundation of approximately 6,800 acres of wildlife habitat, from which terrestrial wildlife species would be similarly displaced.

The inundation of 2,550 acres of bottomlands will eliminate some wood duck nesting sites along Parr reservoir. The absence of broad nesting habitat now appears to be a major limiting factor controlling wood duck production within the project area; however, breeding habitat appears to be abundant. <u>59</u>/ The daily fluctuation of Parr reservoir is not expected to preclude waterfowl usage for feeding, but successful shoreline nesting and rearing of young would be curtailed.

The type of aquatic habitat developed by creation of the upper reservoir would depend largely upon the effect of a daily 4-foot fluctuation, thermal discharges from the Virgil C. Summer nuclear plant, exchange of organisms between the two reservoirs, and the quality of the water, including turbidity.

Fish and associated aquatic organisms would be exchanged between Monticello reservoir and Parr reservoir during pumping and generating cycles of operation. Consequently, some mortalities would occur, as has been indicated in numerous studies made on the fish passing through conventional hydroelectric turbines, both Kaplan and Francis types. These mortalities are related to pressures and mechanical injury, and vary with the operation of the plant and the hydraulic head. The studies generally show high mortalities occurring with negative pressures from cavitation (partial vacuum pockets produced around the runners), with higher heads (where cavitation is more likely) and with less efficient operations than those for which a specific unit is designed. Combination pumpturbines are usually free of cavitation because of deep submergence of the runners and the configuration of the runner blades. In reviewing the design of the pumpturbines with operational data, such as volumes and velocities of water, clearance, speed of rotation, and the species and populations of fish involved, fish mortalities would probably not be significantly high at the project. 13/

Daily fluctuations in Parr reservoir would be as much as 10 feet, and in Monticello reservoir as much as 4-1/2 feet. While the water rise in Parr reservoir would result in 2,550 surface acres of new potential aquatic habitat, a corresponding increase in the total amount of biomass would probably not occur, due to the probable adverse influence of water fluctuations on benthic organisms and spawning activities of nest building centrarchids. Benthic organisms have limited means of locomotion and are unable to travel long distances, and if these relatively nonmotile organisms are subjected to a daily water level change of 10 feet, many would be stranded well above the new water level and would subsequently perish. As a result of this benthic loss, an increase in biomass and carrying capacity of Parr reservoir would not be realized.

Spawning success of centrarchids would be adversely affected by the decreased surface area caused by the daily 10-foot fluctuation in Parr reservoir, while the 4-1/2-foot fluctuation in Monticello reservoir would have a minimal adverse effect on spawning. The effect, if any, that thermal discharges accompanied by daily water level fluctuations in Monticello reservoir would have on centrarchid spawning is unknown. Daily fluctuations of up to 4 feet in Leesville reservoir did not directly affect spawning of the largemouth bass and bluegill. <u>14</u>/ Baren and Howelett (1971) reported similar findings and concluded that these fishes adapted to uniform water level fluctuations. <u>15</u>/ Vogele (1969) found "black basses" nesting to a depth of 15 feet in an Arkansas reservoir, but the greatest depth at which largemouth bass were observed to be nesting was 5 feet. <u>16</u>/

The daily water level fluctuation of 10 feet in the Parr reservoir would adversely affect habitation by the existing small population of fur bearers, such as muskrat, as at times lodges and dens would be completely submerged or left exposed some distance from the water's edge.

During construction, turbidity of the Broad River would increase due to runoff from these disturbed areas, and this effect would be exerted largely on the downstream aquatic

habitat. Increased turbidity would restrict sunlight penetration and thereby inhibit periphyton (attached algae) growth needed to support other aquatic organisms. Siltation would depend upon the rate of flow from Parr Dam. (The adverse effects of siltation upon the aquatic habitat have been the subject of several investigations. <u>17</u>/, <u>18</u>/, <u>19</u>/, <u>20</u>/.) The Applicant's proposed measures to reduce soil erosion during construction are discussed in Section 4.

Noise and activities associated with construction would disrupt wildlife in the area, and thus many of the vertebrates could be displaced. The effect of this disruption would be different for each species, and would be influenced by how well the animals could be absorbed by new areas. After construction is completed and human activity reduced, some species of wildlife would probably return to the old areas.

The effect of noise levels from project operation on resident species is unknown.

Significant changes in flow, temperature, or chemical composition of the Broad River could affect the spawning of the striped bass in the Congaree River downstream. A landlocked population of the striped bass in the Santee-Cooper Reservoir complex is reportedly the only well established one in the world. This species lives in the reservoir complex but spawns in the Congaree River, formed by the confluence of the Saluda and Broad Rivers near Columbia. Spawning occurs in late March to late May when water temperatures are about 60°F. After fertilization, the eggs become water hardened and semibuoyant. Hatching occurs at from 30 to 72 hours depending upon water temperature. If spawning occurs in water above 70°F, high egg mortality usually results. Flow velocity is also important for survival of the eggs, which should be kept suspended in the water column until hatching. If riverflow is too slow, the eggs settle out, or if flow is too fast, they reach the reservoir before hatching and then settle out.

Some heated water would be discharged from Monticello reservoir to Parr reservoir during the spawning months of the striped bass. The interaction of this heated water with that of the reservoir is still under evaluation, but presently it is expected that a measurable temperature increase, if any, would only occur in the tailwater of the Fairfield powerhouse. No significant temperature increase would be expected in the Broad River below Parr dam, and no detrimental impact on striped bass spawning activities would be anticipated. Flow data over the past 40 years show highest flows occurring between January and April of each year, indicating that flows have historically been compatible with striped bass spawning. Low flows usually occur during summer and fall.

The Applicant and the South Carolina Wildlife and Marine Resources Department reached an agreement (Appendix A) that assures maintenance of adequate flows for striped bass spawning during operation of the proposed project.

Construction of the 1-mile long Fairfield-Summer transmission tieline and relocation of the Duke Power Company transmission line would displace some wildlife during the work period. Some ground cover as well as some den or nesting trees would be eliminated. Wildlife forced into adjacent areas might be assimilated without upsetting an existing balanced ecosystem, or they could create imbalances to the disadvantage of resident wildlife. Clearing of the proposed transmission line rights-of-way (approximately 121 and 67 acres, respectively) would create about 11 miles of edge habitat along the Duke Power Company right-of-way and about 2 miles along the Fairfield-Summer tieline right-of-way. With proper management, this edge habitat could enhance production of wildlife by providing a greater variety and abundance of food and cover for wildlife than was previously available. turn, the carrying capacity of the land would be increased.

In

Some loss of bird life could occur from collision with conductors or by electrocution. The extent to which this could occur is related to the visibility and the capacity of the line and clearance between conductors. Waterfowl flying into Monticello reservoir during twilight would be the main species affected.

Recreational development would disturb wildlife habitat, probably even displacing some existing wildlife populations. Such displacement would disrupt adjacent balanced ecosystems, as was described above. During the recreation season, human activities associated with use of facilities could affect wildlife by altering behavioral patterns.

Approximately 300 acres of the upper end of Monticello reservoir would be impounded for a fishing area. This fishing area would draw water from runoff and Monticello reservoir as required, and would probably be clearer than Monticello and Parr reservoirs. Only slight water fluctuations would likely occur. This proposed fishing area would be stocked with bluegill and largemouth bass and should provide an excellent sport fishery.

Operation of the Virgil C. Summer nuclear station would involve the joint use of project waters (Monticello reservoir) for cooling purposes. Impacts on the aquatic ecosystems are discussed by AEC in its environmental statement and are presented below.

Operation of the Summer station would have a significant impact on the biota of Monticello reservoir in the intake structure, heat exchangers effluent discharge canal, and mixing zone. Some mixing with Parr reservoir water would occur as a result of discharges from Monticello reservoir during the generating cycle of the Fairfield pumped storage hydro station.

The cooling water intake structure (see Figures 3-1 and 3-2) would be located flush with the shoreline, where it would not be expected to attract fish or interfere with their movements along the shoreline. The cooling water would be withdrawn from below the surface of the impoundment by use of a skimmer wall extending to a depth of about 10 There would be a possibility, particularly feet. because of anticipated high turbidity, that fish swimming between the skimmer wall and the traveling screens would be unable to find their way out again and would become trapped. 22/ The approach velocity of the intake water would probably be about 0.7 fps, which should be sufficiently low to allow most small fish to successfully avoid being swept into and impinged on the traveling screens. 23/ Water temperature during the time of year young fish would be present in the reservoir would be near optimum (60°F) for swimming performance and thus should not contribute to any significant impingement problem.



Figure 3-1. Intake Structure and Condenser Cooling Water at Monticello Reservoir



3-16

Source: Atomic Energy Commission Final Environmental Statement Virgil C. Summer Nuclear Station January 1973

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Figure 3-2. Plan of Nuclear Station and Condenser Cooling Facilities The water velocity through the screens should be about 1.3 fps, sufficiently low to allow most fish near or on the screen to work their way free by moving laterally across it. Some fish could become caught on the screens and suffocate, or pass through the screens despite the small mesh size, and thus be subjected to thermal and mechanical stresses as they pass through the condenser system. However, the number of fish so affected should be low, and thus the well-being of the fish population of the reservoir should be secure. Because the integrity of the shoreline would be maintained and the velocity of the intake water would be relatively low, the intake structure would probably not cause serious adverse effects.

Any organisms (particularly plankton) entrained in the cooling water as it is withdrawn from the impoundment would be pumped through the condenser system along with the lake water and subjected to thermal and mechanical stresses. At full power operation, the temperature rise across the condensers would be about 25°F, which during the warm months would be superimposed on lake temperatures ranging from the low to high 80°'s. Effluent temperatures of from 105° to as high as 113°F, meanwhile, could also be expected during these months, and temperatures of this magnitude are considered higher than those plankton can tolerate without ill effects. 24/, 25/ During the remaining months, effluent temperatures would be within acceptable limits.

The length of time an organism is exposed to the higher temperature cooling water is also of significance in assessing the impact of passage through the condenser system. At the temperatures often encountered in condenser systems, thermal dose (the combined effect of temperature and time) determines lethality. 26/ During the cooler months of the year when intake water temperatures would be low, effluent temperatures would also be relatively low. During these cooler months the travel time (23 minutes) of the effluent would probably not be of consequence. However, during May through September when intake and effluent temperatures would be high, travel time could be of sufficient consequence to cause significant mortality of entrained plankton.

The mortality of organisms entrained in cooling water could, under certain conditions, present a problem. <u>27</u>/ If mortality is high and the volume of cooling water pumped through the condenser system is a significant part of the lake or river from which it is being withdrawn, then a serious threat to the viability of the ecosystem could exist. On the other hand, if mortality is high but the affected volume is small, compared to the volume of the cooling water source, then any mortality as a result of condenser passage would not necessarily be of consequence to the ecosystem.

The volume of cooling water which would be used in the Summer station condenser system in a day would be small in comparison to the volume of Monticello reservoir. The reservoir would contain about 440,000 acre-feet. Approximately 530,000 gallons per minute per unit (2,350 acre-feet daily), or about 0.5 percent of the reservoir volume, would be pumped through the condenser system daily.

If this water contained the maximum number of plankton found in a water sample from Parr reservoir (7,000 organisms/ liter, each assumed to weigh  $10^{-5}$  grams), <u>28</u>/, <u>29</u>/ then as much as 33,150 tons of plankton could, under the worst temperature conditions, be destroyed each year (221 tons daily) during the warmer months of May through September. If the same number of plankton are distributed throughout the lake, a complete kill in the condenser system would be small compared to the size of the standing crop.

Organisms in the water pumped from Parr reservoir to Monticello reservoir would temper consequences resulting from entrainment losses. Approximately 29,000 acre-feet would be pumped into the reservoir each day during the pump cycle of the Fairfield facility. This water would contain entrained organisms, since no screening would be used on the penstocks. This amount of water represents more than 12 times the amount to be used in the condenser system, so any loss of plankton due to entrainment in the cooling water would not

be significant in Monticello reservoir. The Applicant would monitor this aspect of the operation to measure the actual effects of entrainment and to evaluate its impact on the reservoir.

A mechanical cleaning system, rather than biocides, will be used to prevent fouling of the condenser tubes. Therefore, any adverse impact on entrained plankton will not be aggravated by the condenser cleaning system.

During the summer months the water temperature in the discharge canal and pond would range to  $113 \,^{\circ}$ F. Temperatures of this magnitude are higher than even warm water fish can tolerate; therefore, fish could not occupy the discharge system at this time of year. <u>30/ 31/ 32/</u> During the colder months, the warmer temperatures in the discharge canal and pond would probably attract fish. The attraction of fish in winter to thermal discharges in both marine and freshwater environments is well documented. <u>33/, 36/</u>

It has been suggested that zones of above normal temperature may adversely affect fish through change in maturation time, disease resistance, behavior, metabolic rate, and resistance to low temperatures. <u>37</u>/ If the nuclear power station is temporarily shut down during winter, fish mortality could result from "cold shock," due to the abrupt decrease in temperature in the discharge canal and pond. At the Northport nuclear station, Long Island, New York, striped bass and bluefish were killed during winter when

temperatures in the effluent discharge area were reduced from 51°F to 31°F following shutdown of the plant. <u>38</u>/ More recently, large numbers of juvenile menhaden were lost near the Oyster Creek nuclear power station in New Jersey, when a natural drop of **11°F** in the receiving waters was accompanied by a plant shutdown. <u>39</u>/

At Summer station, approximately 40 acre-feet of water would be contained in the discharge pond and canal, a very small fraction of the 440,000 acre-feet volume of Monticello reservoir. But a rather large number of fish would probably winter in the discharge pond and canal when the water temperatures in this heated area ranges from about 60 to 90°F. A sudden drop of 25°F produced by a station shutdown would probably kill a large percentage of the more heat-sensitive fish in the discharge pond and canal. The actual number of fish which would perish, however, cannot be predicted, since the ultimate fish population in Monticello reservoir cannot be determined until the lake is filled and an equilibrium established with Parr reservoir.

The impact of any fish kill on commercial or sport fishing would be slight, since Monticello reservoir would not be used for commercial fishing, and sport fishing would be principally confined to a stocked and isolated pond at its northern end. Structures between this pond and the main body of water of Monticello reservoir would keep the sport fish from seeking the warm water of the discharge canal. Should

winter shutdown be necessary, and if winter fish kills become a significant problem, measures could be taken at a later date (for example, placing screens or some other device) to discourage fish from entering the canal.

At the Virgil C. Summer plant, fish could also be subjected to rapid increases in water temperature when plant operation is resumed after a shutdown during the winter. Fish in the discharge canal would have to acclimate to the temperature rise or vacate the canal. If fish are unable to avoid the thermal rise, mortality to some would result. This adverse impact should be minimal, however, because fish can avoid adversely high temperatures, and because there would be no concentration of fish in the canal after the plant had been inoperative for a period of time.

The cooling water would be discharged to the surface of the impoundment at a velocity of less than 1 fps, to effect minimal mixing and rapid evaporative heat dissipation to the atmosphere. Vertical mixing of the cooling water would be limited to the upper 10-15 feet of the reservoir; below 15 feet little mixing would be expected. Water temperature would therefore be highest in the surface and near-surface waters close to the outfall. Temperature would decrease with depth to ambient, or slightly above, below 15 feet with increasing distance from the outfall.

As a result of stratification, surface temperatures in part of the mixing zone during the summer months would be higher than would be compatible with fish life. 40/ In July, for example, temperatures in the immediate area of the outfall would range to 113°F. Temperatures this high would be directly lethal to centrarchids. 41/ Subsurface temperatures below the mixing zone and relatively close to the outfall would, however, be acceptable. For example, the temperature preferential for bluegill is about 88°F. 42/ In general, since the fish in the reservoir would be free to move about, they would avoid areas of unfavorable . temperatures created by the mixing zone. 43/ Since the effluent would be discharged on the surface of the lake, the mixing zone would not affect the benthos. Some bluegreen algal growth could be encouraged close to the outfall because of the elevated temperatures which would occur in that area.

The principal effect on Parr reservoir would be that resulting from the fluctuating level caused by operating the Fairfield pumped storage project. The temperature rise of the water to be released from the proposed Monticello reservoir via the pumped storage plant to Parr reservoir is estimated by the Atomic Energy Commission Staff to be less than 3°F under worst conditions of low water and high withdrawal rates. This would be somewhat less than the 3.5°F to 4.2°F increment indicated by the Applicant's model tests.

This temperature increment, although small, could alter species diversity of the aquatic organisms of Parr reservoir in the vicinity of Frees Creek. No discernible effects on fish in Parr reservoir and the Broad River would result. 44/,45/,46/

Nuclear plant start-up wastes, containing primarily phosphate and detergents, would be treated in the sanitary Soluble phosphate would be reduced to 5 ppm by system. precipitation with lime or alum and then sent to the oxidation pond, a part of the sanitary system. The effluent would be discharged to Monticello reservoir along with the water pumped through the turbine condenser system. The rate of water use in flushing prior to start-up is not stated; the Atomic Energy\_Commission Staff assumed that the rate would be of the order of 30,000 gallons/day, since the total discharge would be about 600,000 gallons, and the cleaning period could encompass 3 weeks. Assuming a steady flow into the condenser water discharge of 530,000 gpm, the AEC Staff estimates that phosphates would be diluted 1:25,000 prior tc entering Monticello reservoir, and greatly diluted further in the reservoir. Phosphate would be present in the discharge at a concentration of about 0.2 ppb. Similarly, detergent would be present at about 10 ppb. Because of these very low concentrations and the short term of disposal, the flushing wastes would have virtually no detrimental impact on aquatic life in Monticello reservoir. 47/ Phosphates discharged would serve as a nutrient to plant

growth, but the levels to be discharged are too low to be of concern.

The sludge from phosphate precipitation, which the AEC Staff estimated would consist of about 2 tons of calcium phosphate, would be buried. This would pose no threat to human or wildlife communities since it would be a relatively small amount of a very insoluble compound.

Oil-contaminated wastes from floor drains would be a subject of concern. Oil would be separated from the water prior to oxidation ponding; the water would be discharged in the condenser water channel to Monticello reservoir. Between 10,000 and 30,000 gallons/day would be processed, with a resulting biochemical oxygen demand (BOD) of 6 to 167 pounds/day in the effluent. Upon dilution with condenser cooling water, the BOD of the water entering Monticello reservoir would range from about 1 ppb to 20 ppb. No discernible effects would be produced by this discharge. 48/

The concentration of sodium sulfate would be 0.09 to 0.23 ppm in the condenser water canal. These levels would be far below the existing concentration of salts in the Broad River, and the AEC Staff concluded that disposal to Monticello reservoir would be innocuous.

Effluent from the sewage treatment plant could be chlorinated and discharged to Monticello reservoir by way of the discharge canal. The many thousandfold dilution and the high temperature of the condenser water would reduce
chlorine levels to a concentration far below the point of concern for any effects on aquatic life in Monticello reservoir. If chlorinated to 1 ppm at the sewage plant discharge, the effluent would have a resulting concentration of about 0.04 ppb, assuming a sewage plant flow of 30,000 gpd (estimated from the floor drain system). This low concentration would quickly be reduced to even lower concentrations. 49/

Steam generator blowdown would initially contain salts in the makeup water, small amounts of phosphates, corrosion products, and chemicals for pH control. The dilution in the condenser discharge that would result in concentrations of the salts in blowdown would be inconsequential to biota occurring in Monticello reservoir.

3.4 WATER QUALITY

Water quality of the project reservoir and the Broad River would be affected to some degree by redevelopment of the Parr hydro plant, construction and operation of the Fairfield pumped storage facility, and the joint use of project waters (Monticello reservoir) for once-through condenser cooling by the Virgil C. Summer nuclear plant. Monitoring of inflow upstream and downstream from the project would make it possible to determine any water quality changes attributable to construction and operation of project facilities.

During the construction phase, turbidity and siltation of the Broad River downstream would increase due to erosion from disturbed areas. Presently the Broad River carries a substantial silt load which limits its biological productivity. This turbidity is largely natural and is attributed to the characteristics of the area soils, farming, and development in the watershed.

Any adverse effects on downstream water quality should be short term (the more pronounced during construction and for a few years thereafter), but would depend upon an effective erosion control program which would limit the length of time any area would remain without a stabilizing vegetative cover.

It is possible that enlargement of Parr reservoir would result in an enlarged "sink" for organic matter and other nutrients that provide the necessary substrate conducive to actinomycete growth and odor production. The study conducted by EPA to determine the source and cause of odor problems in the Columbia municipal water supply pointed out that tributaries to the Broad River upstream of the Parr reservoir were the major sources of these nutrients. The EPA indicated that treatment at the sources of industrial and municipal wastes should be implemented,

commensurate with available technology. It is not expected that the 3°F increase in temperature of water reaching Parr reservoir as a result of cooling water from the Virgil C. Summer nuclear station will greatly enhance actinomycete development. This water would be diluted by waters of the Broad River so that no increase would be apparent below Parr dam. Furthermore, this temperature change would affect only a small portion of the Parr reservoir.

Monticello reservoir would provide water for once through cooling for the Virgil C. Summer nuclear station. A hydraulic model study of the overall hydrologic system is being conducted by Alden Research Laboratories at Worcester Polytechnic Institute, Massachusetts. This model simulates Monticello reservoir, Parr reservoir, and Broad River inflows and outflows. Superimposed on the model are the thermal and/or hydraulic characteristics of the proposed Fairfield pumped storage facility, Units I and II of the Summer station, Parr steam electric station, and Parr hydro station. Conclusions reached from preliminary model studies by Alden Research Laboratories are as follows: (1) The overall concept of the Parr hydroelectric project is feasible.

(2) The average daily water temperature increase at the discharge of the pumped storage plant into the Broad River would be less than 3°F, with a 25°F temperature rise at the discharge channel for two nuclear units. The maximum measured temperature rise in the Broad River during any phase of the pumped storage process would be 4.2°F. These predicted temperature increases would fall well within the 5.0°F limit set by the South Carolina Pollution Control Authority.

(3) Maximum heat transfer in the upper impoundment would be achieved by stratifying the upper impoundment through use of a low velocity surface discharge. Maintenance of the stratification would be necessary to keep the water temperature discharged into the Broad River at a minimum.

(4) Heat transfer to the atmosphere would be less in the colder months than the warmer months.

(5) A 25°F temperature rise would be experienced by the cooling water as it passed through the Virgil C. Summer nuclear plant condensers, without exceeding a maximum daily average temperature rise of 3°F in the Broad River at the Frees Creek confluence. (6) Damming off a small northern portion of the upper impoundment for recreation would have no measurable effects on the overall heat distribution in the project.

(7) Further testing is required of undistorted models of the nuclear plant structures and the pumped storage structures to maximize stratification and minimize recirculation.

Vertical mixing of the nuclear plant heated effluent with reservoir waters would be limited to the upper 10-15 feet of Monticello reservoir with little mixing below 15 feet. Water temperatures would be highest at the surface and near-surface waters of the outfall. July temperatures in the immediate vicinity of the outfall could range to 113°F. Predicted surface isotherms from Alden studies for the project at 24.5°F temperature rise (Figure 3-3) and at 14.7°F temperature rise (Figure 3-4) for two different flow rates indicate the configuration of the thermal plume as well as temperature at Frees Creek. These figures substantiate conclusions 2 and 5 above.

Further model testing by Alden Research Laboratories indicates that the project will meet the State of South Carolina temperature criteria when operating a nuclear unit with a condenser flow of 530,000 gallons per minute with a temperature rise of 25°F. Conclusions are presented in Appendix F on Alden's Progress Report No. 2 on one-unit and two-unit operation at ambient river water temperatures of 45°F and 60°F. No temperature increase in the subimpoundmount is foreseen due to thermal discharges from the nuclear station. Mixing of waters would not occur under normal operating procedures and little conduction would be expected through the dike separating the impoundments.

Presently it is unknown to what degree dissolved oxygen (DO) would be affected by discharge of heated water from the proposed nuclear station into the Monticello reservoir. However, it is well known that temperature is important in determining the solubility of oxygen in water: the solubility of oxygen decreases with the increasing water temperature. No significant reduction in the DO content of the condenser cooling water is expected. <u>50</u>/ However, some DO reduction could occur in the mixing zone of Monticello reservoir. Any DO reduction in the mixing zone would be determined by the saturation value at the discharge temperature. A further decrease of DO could occur in this region, due to increased rates of organic decomposition or an increase in metabolic activities of aquatic organisms brought about by the increased temperatures.

A reduction in DO could occur as a result of release of subsurface water from Monticello reservoir via the Fairfield facility. However, due to the turbulence and agitation that would take place in the tailrace, deficient DO concentration should not occur. It has been reported



Figure 3-3. Thermal Plume in Monticello Reservoir from Condenser Cooling Water Heat (24.5 Degree Condenser Water Temperature Rise)



Thermal Plume in Monticello Reservoir from Condenser Cooling Figure 3-4. Water Heat (14.7 Degree Condenser Water Temperature Rise)

that tailwater fishing for brown trout and striped bass is good at the Saluda hydro plant. <u>51</u>/ Here waters are - released from a depth of 145 feet, where DO depletion would be expected, but the water is aerated in the tailrace to such a degree that these fish are able to survive.

Due to the relatively large daily drawdown and inflow and mixing of reservoir water with that from Monticello reservoir, stratification would not occur in Parr reservoir. Therefore, operation of the redeveloped Parr hydro plant would not adversely affect DO in the Broad River downstream of Parr dam. Thermal stratification would be artificially increased in Monticello reservoir as a result of surface discharge of heated condenser water from the nuclear station. This warmer layer would act as a lid on the hypolimnetic layer and thereby prevent total reservoir mixing. Stratification could decrease water quality downstream when water is withdrawn from the hypolimnion, which is usually very low in DO. However, DO concentration would probably not be deficient downstream, due to the turbulence and mixing action that would occur in the tailrace area.

The adverse effects on water quality of chemicals discharged from the nuclear station to Monticello reservoir have been discussed in the Atomic Energy Commission's Final Environmental Statement. These chemical discharges were separated into the following categories: start-up water, floor drain and oil-contaminated wastes, ion exchange

regenerant wastes, sewage and other sanitary wastes, and steam generator blowdown. According to AEC Staff, none of the above discharges would significantly alter water quality and adversely effect aquatic biota. All the discharges coupled with the thermal discharge could have a cumulative adverse effect.

3.5 OUTDOOR RECREATION

The overall impact on land and water resources of the project area resulting from increased recreational use would probably not be significant. Provisions to dispose of solid and other wastes generated through increased recreational use, as proposed by the Applicant, are considered adequate. The Applicant's proposed radioactive waste processing system would be adequate for protection of persons using the subimpoundment fishing area and Parr reservoir.

Two of the proposed facilities, however, are of concern. Initial development, as proposed by the Applicant, could lead to maximum use of the picnic area on Monticello reservoir and possible overuse of the fishing subimpoundment.

The three recreation areas planned for initial development, the boat launching area on Parr reservoir, the scenic overlook on Monticello reservoir, and the subimpoundment fishing area,would occupy 2, 30, and 300 acres, respectively. An additional 1,082 acres would be reserved for future recreational developments. Future recreational facilities proposed within the project boundary would include areas for general recreational development for which the specific uses would be determined later. Future facilities considered by the Applicant would be the expansion and/or addition of boat landings, picnic areas, and camping sites.

Physical features of the project area would be altered to provide for recreational facilities as proposed by the Applicant. Those facilities intended for use by the general public, such as visitor overlook, fishing impoundment, and boat launching areas, would allow for controlled management in channeling visitor use to specific developed sites.

Most areas of Parr reservoir would not be considered suitable for recreational use, due to an anticipated 10-foot daily water level fluctuation. This fluctuation would probably result in reduction of the biological carrying capacity of the reservoir, which would decrease the present fishing success. In addition, the exposed shoals caused by the fluctuations would be extensive, reaching an average horizontal distance of 375 feet from the high water mark in some areas. Such extensive mudflats would greatly curtail the boating potential of the reservoir. The fluctuation would likewise reduce waterfowl feeding areas, and consequently adversely affect the waterfowl hunting in the area. The high turbidity of Parr reservoir and the somewhat lesser turbidity expected in Monticello reservoir would be aesthetically unappealing.

Daily downstream flow releases, averaging at least 300 cubic feet per second, would have no adverse effects on public recreational use and development below Parr powerhouse. On the other hand, recreational use of Frees Creek immediately below the Southern Railroad trestle would be inhibited due to the combined effects of drawdown and rapid stream flow.

Water within the recreational subimpoundment would initially be turbid and aesthetically unappealing after filling from Broad River. Furthermore, the periodic intermixing of the partially turbid waters of Monticello reservoir with subimpoundment waters could increase the turbidity of the subimpoundment. Nevertheless, the water in the subimpoundment is expected to be clearer after initial filling than the water in Monticello reservoir proper.

3.6 SCENIC, NATURAL, AND HISTORIC AREAS

The proximity of Monticello reservoir to State Route 215 for several miles would create a visual edge, providing relief from the narrow corridors formed by the pines bordering the road. Road stretches enclosed by trees could have openings that would increase the visual complexity and interest of the area. The spatial sense of the area would change from that of a narrow monotonous feeling to wider changing spaces

with visual interest provided by glimpses of a nearby body of water.

The pines within the project boundary adjacent to Monticello reservoir would, in time, be succeeded by hardwoods and water-associated plants that would increase both the biological and visual complexity of the area.

The 4-1/2-foot, almost daily fluctuation in the Monticello reservoir would create mud flats, which affects detrimentally the scenic qualities of a normal land-water edge of a nonfluctuating lake. A distinct visual edge would attract a viewer's attention, and in the case of a fluctuating reservoir, his attention would be drawn to its worst feature, the mud flats. Further, the upper reservoir would be at its lowest elevation during the late afternoon and early evening during times available for recreation in the summer. Operation of this reservoir would, however, be limited essentially to weekdays, with less fluctuation during the weekend periods of highest visitation and recreational use.

The more extensive fluctuation of Parr reservoir from the proposed higher elevation would create extensive unsightly mud flats, with an estimated average width of 375 feet when the reservoir was drawn down to its minimum elevation.

Much of the land between elevation 256 feet msl and 266 feet msl, including the islands formed in Parr reservoir, would be cleared. The only road near the reservoir is a secondary hard-surface one that, except for two points, is

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from 0.3 to 1 mile away. All views of Parr reservoir, except at the crossing of Cannons Creek and Hellers Creek, would be blocked by mature bottomland forests. The crossings of Cannons and Hellers Creeks would present extensive, unsightly views of mud flats and snags during low water stages. The greatest exposure to this view of mud flats would occur during early morning hours of weekdays and on weekends. This is because the operation schedule would have Parr reservoir drawn down during the weekend when most family pleasure driving and other recreational activities occur.

The only registered national historic site directly affected by construction of the project would be the Davis Plantation, 1/4 mile south of the town of Monticello. The plantation house is on a prominent hill that overlooks the proposed Monticello reservoir. The upper reservoir edge would be 1,000 feet from the house at the nearest point, inundating several acres of existing pasture land. While this would not directly affect the plantation house itself, the scenery would be greatly altered from rolling wooded hills to a large expanse of water.

The four archaeological sites located in the area would not be inundated by the project. However, the occasional find of arrowheads or other artifacts in the project area indicates the likelihood that some unknown

archaeological sites could be covered by water.

3.7 NOISE LEVELS AND AIR QUALITY

Noise, dust, and engine exhaust would be undesirable effects associated with the construction of the proposed project. The exhausts of construction equipment and vehicles of commuting workers would be an added stress on the residents and wildlife of the area. However, the low population density and large forested areas around the project should render such effects negligible. To some extent, noise and traffic would displace wildlife during construction activities, some species more than others.

The project would have little or no effect on air quality at the site during operation. Most of the pumping energy would be furnished by nuclear power. Noise associated with the Fairfield pumped storage project, such as that from generation and pump operation and flowing water, would not be audible more than 100 yards away from the powerhouse.

The effects of the construction and operation of the Virgil C. Summer nuclear plant on the quality of the air and noise pollution are discussed in the AEC Environmental Impact Statement. Compliance with State and Federal regulations is expected, and monitoring would occur to assure such compliance.

Applicant has stated that any necessary burning of vegetation during clearing operations would be carried on in compliance with South Carolina State Regulations. Air quality would not be significantly affected.

## 4. <u>MEASURES TO ENHANCE THE ENVIRONMENT OR TO AVOID OR</u> <u>MITIGATE ADVERSE ENVIRONMENTAL EFFECTS</u>

The most obvious adverse environmental effects would occur during construction of the proposed project with accompanying excavation, clearing, diking, flooding, and other activities. The Applicant has stated that the contractors would employ specific construction practices associated with minimizing detrimental effects. The proposed measures would include: <u>52</u>/

(1) Soil erosion protection: reducing the duration of soil exposure to a minimum, retaining and protecting the natural vegetation whenever possible, and installing conduits and settling basins. A storm water drainage system would be installed as soon as practicable.

(2) Dust control: frequent water sprinkling of roads, parking lots, and construction staging areas.

Other erosion control procedures would include the development of appropriate temporary and/or permanent ground cover such as planting downstream faces of the dams, replanting construction lay-down areas, and placing riprap on the upstream faces of the dams where support for vegetation growth is unavailable. Prior to initiating licensed project construction activities, the Applicant would prepare job specifications to include practices for soil and water conservation as advised by the Fairfield County Soil and Water Conservation District office located in Winnsboro, South Carolina.

Borrowing would take place in the cleared Monticello reservoir area, so that when the project is completed there would be no unsightly scars on the landscape. Dredge spoils would be disposed of by placement behind nearby embanked areas. After the water is drained, the areas would be planted with appropriate vegetation consistent with the precepts of the land management program discussed below.

Construction debris not salvaged and used could be disposed of in several ways. For the trash and combustible materials appropriate disposal permits from the South Carolina Pollution Control Authority and the South Carolina Forestry Commission would be obtained. These materials would be placed in carefully constructed areas within the boundary of Monticello reservoir, and burned under proper supervision, with fire-fighting equipment present. For the incombustibles, hauling, burial, and special use could be employed. Unsightly materials of no use would either be transported to a State-approved disposal site or disposed of by burial or other appropriate means. As part of the management program, an evaluation would be made to see if this debris could be used in the upper impoundment as fish habitat enhancement materials.

4:1 MITIGATION OF ADVERSE EFFECTS ON HUMAN ELEMENTS

The impact of construction of the proposed project in such a sparsely populated rural area could disrupt local

services, traffic, schools, school busing, and local businesses.

The Applicant, aware of the problems that rapid changes would create, informed the people of the area about the proposed project through local meetings held in Newberry and Fairfield Counties. To facilitate communications, the Applicant helped form a citizens committee composed of seven area residents. 53/ The Applicant arranged trips for the committee to a pumped storage project in Pennsylvania, to the Alden Research Laboratories in Massachusetts where the project was modelled, and to the Keowee-Toxaway nuclear plant in South Carolina. 54/ The committee met with both area residents and company representatives to discuss problems associated with the plants in Pennsylvania and South Carolina.

Three basic areas of human concern on project construction were defined by the committee: (1) increased road hazards, (2) development of undesirable businesses, and (3) a possible heavy influx of construction workers which could strain area service facilities.

The Applicant discussed the traffic problem with officials of the South Carolina Highway Department and advised them of the anticipated increase in traffic due to the construction work force. They were informed that the traffic flow of State Highway 215, the primary road

in the area, would not be heavy enough, even with the construction increase, to justify a four-lane road. <u>55</u>/ Two particular places on Highway 215 that could prove hazardous were discussed, one in Jenkinsville at the intersection of Highways 213 and 215, and the other one at the entrance of the proposed nuclear plant. The highway department stated that they were familiar with both locations and felt that improvements would be necessary and would be made to insure maximum highway safety. <u>56</u>/

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The Applicant also met with the School Bus Division of the South Carolina Department of Education to discuss the need to arrange construction shift times and related travel to avoid times of school busing. <u>57</u>/

Recognizing the concern regarding undesirable businesses in the community, the Applicant consulted with members of the Fairfield County Council, the County Planning Commission, and the Central Midlands Planning Commission to determine what could be done to insure the stability of the community. This problem was discussed in depth with the Central Midlands Commission and arrangements were made for a commission representative and a member of the Fairfield County Planning Commission to meet with the community committee to review countywide zoning and mobile park locations. The community was informed, however, that zoning could be accomplished only by local legislation.

Consultation with the Applicant's construction contractor indicated that approximately 30 percent of the work force would comprise residents within a 25-mile radius of the project, and that most of those relocating would probably find housing in the Columbia, South Carolina, area (as discussed in Section 3).

4.2 LAND MANAGEMENT PROGRAM

The Applicant has proposed a land management program to alleviate the adverse effects of construction and speed the ecological adjustment of the project area. The program would include aesthetic improvements and enhancement of recreational facilities and wildlife habitat. The program would be fully integrated with overall facility planning, the monitoring programs, and the ecological study programs. The Applicant's land management proposal would include:

(1) Erosion control: A program would be instituted by the Applicant for preservation of ground cover to control erosion during construction. Cover of land areas along access roads and transmission lines would also be protected. Control measures during construction would also include the scheduling of clearing and grading operations to minimize the susceptibility of the area to

erosion. The Applicant would also work with the U.S. Department of Agriculture, Soil Conservation Service, and the Fairfield Soil and Water District, to minimize erosion by incorporating recommended soil and water conservation practices. The protective measures would be integrated with wildlife management and landscape programs so as to obtain the greatest enhancement benefits.

(2) Timber management: A program would be put into effect on the Applicant's lands to develop and utilize the forest potential. This program would consider the multipurpose use of these lands for wildlife and recreation as well as forestry. It would be integrated with the wildlife management and recreational programs. The options that the Applicant has with the present owners reserve to the owners the right to remove the present timber within a stated period of time.

(3) Wildlife management: This program would be conducted in conjunction with the improvement of habitat through selective plantings of appropriate food and cover plants, particularly in cleared and idle buffer areas. Suitable areas could be developed and set aside as wildlife refuges, depending on the results of ecological studies. The U. S. Forest Service has negotiated an agreement with the Applicant to develop wildlife habitats along the Broad River (Appendix G, attachment to South Carolina Electric & Gas Company letter, dated February 1, 1974).

(4) Recreational potential: Recreational facilities and activities compatible with the area needs, normal project operations, and public safety would be developed. Land areas for recreational facilities planned for Monticello reservoir would be acquired prior to 1977 and would accommodate picnic sites, primitive campsites, boat launching ramps, and a scenic overlook. In conjunction with the construction of the nuclear station, a visitor center would be constructed on a site overlooking the project area. This center would contain educational exhibits of both the nuclear station and the Fairfield facility and provide a panoramic view of the project. The center would be built during the early construction stage of the project. The recreational development plan is described in Section 1 of this statement.

(5) Impoundment management: Both the Monticello impoundment and Parr reservoir would be developed with consideration of the potential recreational benefits, as well as thermal cooling and power generation purposes. The uppermost (northern) portion of Monticello reservoir, impounded by a roadway fill, would not be affected by the daily impoundment fluctuations and would be developed as a fishing area. The southeast shore near the nuclear station would be developed as a scenic overlook. A boat launching facility would be constructed on Parr reservoir.

Impoundment management would be consistent with the safe operation of the facility and in accordance with all applicable requirements of the South Carolina Pollution Control Authority and the South Carolina State Board of Health.

(6) Vector control: As a result of the clearing operation, both Parr and Monticello reservoirs would be clear cut around the periphery of the impoundments between maximum and minimum water levels so that no timber would be exposed. Standing trees would be topped 5 feet below minimum water level, except for some areas in the fishing subimpoundment. Periodic patrols would be established to remove floating materials. Steps would be .taken to eliminate stagnant pool formation due to incomplete drainage of the reservoirs during drawdown. Partially submerged underbrush around the shoreline would be eliminated. Fluctuations of the reservoir due to operation of the pumped storage facility would also control mosquito breeding and larvae production. Periodic inspections would be made around the perimeter of the reservoirs after they were filled to determine the effectiveness of the control procedures. If the need for spraying is indicated, the Applicant would consult with the South Carolina State Health Department and implement a spraying program to assure that no objectionable vector problems occur.

(7) Landscaping: Landscaping would improve the aesthetic qualities of the areas. This program would be integrated with the other land management programs to insure maximum benefit. Maximum utilization would be made of native vegetation with formal landscaping confined to localized areas on the site.

4.3 MEASURES TO MITIGATE ADVERSE EFFECTS ON FISH AND WILDLIFE

The Applicant's environmental report stated that the Applicant would conduct a biological monitoring program on both reservoirs to assess the effects of construction and operation of the Fairfield pumped storage facility and the Virgil C. Summer nuclear station. <u>58</u>/

Primary emphasis would be placed on any species representing a unique group and on species important from a sport or commercial standpoint. Lower food chain organisms would also be studied. Specifically, the program would be designed to:

(1) Document the present biological characteristics of the site environs.

(2) Provide a basis for selecting measures which could minimize any projected adverse effects (including thermal, chemical, radiological, biological, hydrological, and mechanical effects).

(3) Evaluate the effects of construction and operation of the proposed facilities on the biota.

The program would be conducted in two phases: Preoperational and operational. The preoperational phase would provide baseline information on the various aquatic and terrestrial biota in the site environs. A report on this phase is presently being finalized. The operational phase would identify and evaluate changes in the baseline characteristics as a result of construction and operation of the facilities.

The aquatic portion of preoperational monitoring is presently underway. The initial survey was performed in March 1971 (spring sample), and the summer sampling commenced in June 1971. The monitoring consists of the following: £

(1) Collection of fish samples at various points on the Broad River.

(2) Collection of samples of the various bottom types in the river (benthos).

(3) Collection of plankton for identification and counting.

(4) Field and laboratory examination of species collected to aid in the identification, estimation of age, and growth rates would also determine pertinent population parameters, and evaluate taxonomic characteristics.

Preoperational terrestrial biological monitoring began in June 1971 and involves a habitat classification and wildlife survey. Habitat classification consists of mapping the various vegetative types in the site environs. Care is taken to note and evaluate any enhancement potential arising during the conduct of the study. Particular emphasis is placed on potential waterfowl habitat development.

The wildlife survey would consider the most predominant forms of both vertebrates and invertebrates.

The operational biological monitoring would involve Parr reservoir and also include Monticello reservoir sampling and taxonomic work similar to the preoperational efforts, and would consist of the following:

(1) Specific studies to evaluate the effects of the various facility operations on aquatic organisms.

(2) Tagging and studying of key species to evaluate the impact of the project on the life history of these species.

(3) An evaluation of the changes in ecological conditions as compared to the baselines established in the preoperational phrase.

Quarterly or seasonal migration and spawning data would be taken from wildlife and fish samples. Aquatic sampling was begun in 1971. The initial sampling locations are shown on Figure 4-1. Certain sampling points have been and may be relocated to conform with seasonal requiements, as determined by the results of the monitoring as it progresses. Details of the biological monitoring program are presented in Table 4-1.



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Biological Monitoring Programs

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PROGRAM	VECTOR OR INDEX	FREQUENCY OF SAMPLING	ANALYSIS	LOCATION 1/
Aquatic	Fish	Quarterly	Species inventory, popu- lation composition, age growth rates, condition factors and life cycles of important game species.	Stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13
	Plankton	Quarterly	Quantitative and quali- tative analysis of phyto- plankton and zooplankton. Development of food web relationships and indicator organisms.	Stations 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13
	Benthos	Quarterly	Same as plankton	Same
Terrestrial	Habitat	Quarterly	Classification and Mapping of vegetative types correlated with soil studies.	Project Area
	Wildlife	Quarterly	Species inventory, popu- lation trends, life cycle and home range of impor- tant game species.	Project Area
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A waterfowl habitat improvement plan would be carried out around both reservoirs. The impoundments would attract waterfowl during spring and fall migrations. Standard techniques would be used to provide food and additional resting areas. This plan would be a significant contribution to the Broad River waterfowl plan which has been developed by the South Carolina Wildlife and Marine Resources Department in cooperation with the U.S. Forest Service. The management plan report lists the following "built-in" features of the area: (1)natural ponds and ox-bows, (2) open fields which can be utilized for game food production, (3) greentree reservoir sites; (4) suitable private lands already under cooperative agreement, (5) hydroelectric reservoirs, (6) a native wood duck population, and (7) suitable habitat in the Tyger and Enoree bottoms for future additional development.

The principal methods for attracting and holding waterfowl are:

(1) Planting 'food patches, (2) flooding certain areas during the fall with the aid of control dams and (3) providing several "refuge-type" resting and feeding areas.

An agreement concerning protection of fish and wildlife has been reached between the Applicant and the South Carolina Wildlife and Marine Resources Department.

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Two major points of the agreement are: (1) a continual release of water (150 cfs minimum flow) from the Parr reservoir necessary for the survival, reproduction, and normal life cycle of all species of fish with particular concern to striped bass during the spawning period of March, April, and May; and (2) the dedication by the Applicant of approximately 90 acres of land for a greentree reservoir site.

An additional fish mitigative measure for Parr reservoir, if found to be desirable during operational studies, would be regulation of reservoir fluctuations during spawning activities of warm water species, to provide more stable elevations and improve spawning success.

4.4 MEASURES TO MITIGATE ADVERSE EFFECTS ON WATER QUALITY

The Applicant has proposed to plant ground cover to control erosion on disturbed land areas, i.e., access roads, saddle dam sites, and transmission line rights-of-way. Clearing and grading operation would be scheduled by the Applicant to minimize susceptibility of the area to erosion. The Applicant has also stated that it would work with the U.S. Department of Agriculture, Soil Conservation Service, and the Fairfield Soil and Water District, to minimize erosion by incorporating recommended soil and water conservation practices.

The possibility of accumulation of some heavy metals, i.e., chromium, copper, cadmium, lead, and mercury in Parr and Monticello Reservoirs has been raised. Any water quality monitoring program should include analysis for these metals.

Water quality monitoring sponsored by the Applicant would:

(1) Evaluate the baseline physical and chemical characteristics of Broad River and Frees Creek before and during construction,

(2) Determine the quality of the water in Monticello and Parr reservoirs and the Broad River after construction,

(3) Compare the quality of water in the subimpoundment reservoir and river with applicable standards to assure compliance with regulations, and

(4) Provide data for an evaluation of the impact of the project on the aquatic biota.

Two continuous recording stations would be operated by the Applicant so that information could be obtained before and during construction and during operation. Tentatively, these stations would be located near the mouth of Frees Creek and approximately 5 miles upstream from Parr dam on the Broad River. The stations would utilize complete portable, battery-operated recording instruments to measure dissolved oxygen, temperature, stream flow, conductivity, and pH, Each station would consist of the instrumentation, an allweather enclosure, and a permanent enclosure stand. The instrumentation would be the portable recording series type. These instruments are battery-operated with individual strip-chart recorders for each parameter. In addition, the Applicant would secure bottle samples from various locations on a monthly basis to verify the recorder results and provide a more complete analysis. The sample locations would tentatively be as follows:

(1) Frees Creek, two samples: A station 1 mile upstream and one approximately 2 miles upstream from the mouth of the creek, and

(2) Broad River, four samples: One approximately one-half mile upstream, one approximately 3 miles upstream, one 5 miles upstream, and one approximately 1 mile downstream from Parr dam.

Table 4-2 describes the type of analyses to be per-- formed in accordance with standard methods.

During project operation, the monitoring would continue, with deletion of the Frees Creek stations and addition of new stations to correspond to the project development. The monitoring would therefore be implemented in stages as project development and operation progress.

After Monticello reservoir is filled, a continuous recording station would be installed by the Applicant in the vicinity of the pumped storage inlet to monitor the quality of water in the impoundment and record temperature, dissolved oxygen, conductivity, pH, and turbidity.

## Table 4-2

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Frequency of Sampling	Vector or Index	Analysis	Location
Continuous	Surface Water	Dissolved Oxygen Temperature Stream Flow Conductivity pH	<ol> <li>Near mouth of Frees Creek</li> <li>Five miles up- stream of Parr Dam</li> <li>Monticello Reser- voir near pumped storage intake</li> </ol>
Continuous	Monticello Res- ervoir Water	Temperature Dissolved Oxygen	<ol> <li>V.C. Summer Nuclear Station intake and discharge</li> </ol>
Monthly for pre-opera- tional and for first year oper- ational. This fre- quency may be reduced with time.	Surface Water (laboratory analysis)	Temperature Carbon Dioxide (C0 <sub>2</sub> ) pH Dissolved Oxygen (0 <sub>2</sub> ) Total Dissolved Solids (TDS) Conductivity Total Alkalinity(CaC0 <sub>3</sub> ) Total Hardness (CaC0 <sub>3</sub> ) Chloride (Cl) Sulfate (S0 <sub>4</sub> ) Silica (Si0 <sub>2</sub> ) Iron (fe) Calcium (Ca) Magnesium (Mg) Sodium (Na) Phosphate (P0 <sub>4</sub> ) Ammonia (NH <sub>3</sub> ) Nitrate (N0 <sub>3</sub> ) Biochemical Oxygen Demand (BOD) Chemical Oxygen Demand (COD) Heavy Metals	<ol> <li>Both continuous recording stations</li> <li>2 Samples on Frees Creek (pre-opera- tional), 1 &amp; 2 miles upstream from Broad River</li> <li>4 samples on Broad River 1/2, 3 &amp; 5 miles upstream &amp; 1 mile downstream from Parr Dam</li> <li>3 stations in Monticello Reser- voir (operational)</li> </ol>
Quarterly	Groundwater Monticello Reservoir	Same as monthly surface water Total Nitrogen Ammonia Nitrogen	Springs & wells, at least 8 locations; piezometers 3 stations in Monti- cello Reservoir
		Nitrate Nitrogen Total Phosphorus Orthophosphate BOD or TOC Dissolved Oxygen (0 <sub>2</sub> )	

## Hydrologic Monitoring Programs

Source: South Carolina Electric & Gas July 1972 Revised Application

r F Three sampling stations, in addition to the continuous recording station, would be established in Monticello reservoir. Monthly measurements of temperature and dissolved oxygen on the surface and at 3, 5, 10, and 15-foot depths would be taken at these stations.

To evaluate the trophic conditions of the impoundment, the Applicant plans to make quarterly analyses of selected bottle samples for total nitrogen, ammonia nitrogen, nitrate nitrogen, total phosphorus, and orthophosphate. The oxygen consumption or demand properties of the water would be determined by a biochemical oxygen demand (BOD) method or by the total organic carbon (TOC) means. The TOC means is preferred over the BOD method because it is more readily accomplished and is reproducible. Also, TOC is less likely to be erroneous due to interference of other chemical constituents. However, the present generally unpolluted conditions of the Broad River water and the expectation that little organic material would be added to the system as a result of operation of the facility suggests that BOD would be an adequate measure of the oxygen demand in the system. The dissolved oxygen would be measured in conjunction with the oxygen demand measurements.

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After completion of the nuclear station, continuous -recording stations would be installed near the condenser intake and discharge. These stations would provide data on the temperature and dissolved oxygen content of the water passing through the condensers.

Monitoring would provide data on the physical and chemical properties of the groundwater in the site vicinity. Samples would be taken at various springs and wells in the vicinity of the project. The exact number and location of these samples would be determined in the field, but at least eight points would be sampled. Water quality samples would be collected and subjected to laboratory analyses; water level and spring flow measurements would be made quarterly.

4.5 MITIGATION OF ADVERSE EFFECTS OF RECREATIONAL DEVELOPMENT

The environmental impacts associated with construction of the proposed recreational developments would include: (1) erosion from clearing for parking areas and access roads, (2) run-off, carrying sediment and debris from the hard surfaced and natural areas, (3) run-off, carrying sediment and debris from construction of the subimpoundment dam, and (4) loss of wildlife habitat.

Operation of the proposed recreational developments would increase stress on the area to assimilate the wastes
generated and increase traffic in recreational areas and on the highways.

All recreational site areas covered by water would be cleared and grubbed to varying extents according to the planned use of a specific water area, including fishing, boat launching, and swimming.

To the fullest extent possible, all marketable timber would be removed by the present land owners or by the Applicant prior to land inundation. The Applicant would also remove the necessary timber only from lands set aside for recreational purposes and those required for construction purposes.

The Monticello subimpoundment would be clear-cut from elevation 420 feet to elevation 425 feet. The timber and undergrowth of shallow inlets and portions of the shoreline would remain undisturbed. Where trees would be cut below the water surface, a 5-foot water clearance would be maintained over stumps. Where the tops of stumps would be above elevation 420, the upslope side of the stumps would not exceed 6 inches in height. The underwater area for 100 feet around the boat launching ramps would be cleared and grubbed to elevation 425. In the subimpoundment, the potential swimming area and the underwater area within 100 feet of the shoreline would be clear-cut and grubbed to a depth of 15 feet from elevation 425 feet. Boat launching areas planned for Parr reservoir would be cleared and grubbed from elevation 266 feet to elevation 257 feet for a distance of 100 feet on each side of the ramp.

All cut but unused trees and brush would be windrowed and burned in accordance with Regulation No. 2A of the South Carolina Pollution Control Authority. Inaccessible areas containing large amounts of forest debris would be burned in small plots by controlled forest fire. Parr reservoir would be filled and large floating debris would be removed, allowed to dry, and burned in accordance with South Carolina Pollution Control Regulation No. 2A.

.When Parr reservoir, Monticello reservoir, and Monticello subimpoundment are full, the Applicant would establish a routine shoreline patrol to remove all dying trees, large floating debris, and other hazards to aquatic activities.

The Applicant's proposed vector control program would be initiated during the clearing operation. The impoundments would be clear-cut around their periphery between maximum and minimum water levels so that no timber or brush would be exposed. Steps would be taken to eliminate stagnant pool formation due to incomplete drainage during drawdown of the reservoirs. Areas around the shoreline containing partially submerged underbrush would be eliminated. Fluctuations of the reservoirs due to operation of the pumped

storage facility would aid in controlling mosquito breeding and larvae production. Periodic inspections would be made around the perimeter of the reservoirs after filling to determine the effectiveness of the control procedures.

Signs located at the entrance to each public access area would indicate the type and location of facilities, and the special use and occupancy rules. Appropriate warning signs and maps would be located at all of the Applicant's boat landings. Reevaluation of the restricted areas for public use would be made after the project is in operation and during the biennial review of the recreational needs of the area.

The public would be excluded from certain areas within the project due to the potential dangers. These areas would include, but would not be limited to, a 300-foot maximum approach distance to all points where intake or discharge structures have been placed on the Monticello impoundment shoreline that would be part of the operation of the Fairfield pumped storage facility or the Virgil C. Summer nuclear station. All restricted areas of Monticello reservoir would be marked with can buoys. Also excluded from public use would be the tailrace of the Fairfield powerhouse, which would be marked by the use of can buoys and by signs facing Parr reservoir on both ends of the Southern Railway Company trestle.

The area upstream of Parr powerhouse is already marked with 11 buoys and 11 more would be added. The Parr dam and

Bascule gates would be flood-lighted at night and the tailrace of Parr powerhouse would be marked with can buoys \_ bearing the standard inland waterways "No Boats Allowed" symbol.

The proposed project boundary would surround the recreation areas, but otherwise generally would follow a minimum of 25-foot horizontal distance upslope from the 266-foot contour for the lower reservoir and the 425-foot contour for the upper reservoir. Adequate shoreline control could not be achieved unless a perimeter of land were maintained around the reservoir, to protect scenic values and permit orderly development of the recreation program as proposed by the Applicant.

4.6 MEASURES TO MITIGATE ADVERSE EFFECTS ON NATURAL, SCENIC, HISTORIC, AND ARCHAEOLOGICAL VALUES

During construction, the scenic values of the area would be disrupted until completion of all plant seeding programs. While the proposed land management program would not completely correct this problem, it would soften any harsh visual effects associated with the construction. Landscaping and replanting disturbed areas with indigenous plant species would soon heal the construction scars and soften the outlines of the project facilities. The proposed Fairfield powerhouse and penstocks and the raised Parr dam would not be visible from any hard surface highway. Even so, the penstocks would be painted a dark muted color to blend into the hillside and the face of the Frees Creek dam. The nearest view of any of the dikes would be from 1 mile away. The

nearest view of the main Frees Creek dam would be from approximately 1-1/2 miles. However, the nuclear plant would be highly visible from many points on State Route 215 adjacent to Monticello reservoir and from Davis Plantation.

The most difficult adverse scenic effects to deal with would be those resulting from project operation. Water-level fluctuations in Parr and Monticello reservoirs would periodically present some unsightly mud flats and bared shoals. The greatest water-level fluctuations would occur in Parr reservoir (about 10 feet) and would expose a substantial amount of the near-shore bottomland. The visual impact of these exposed areas around Parr reservoir would be mitigated somewhat, because the lowest water levels would occur largely at night when the Fairfield facility is operating in the pumping mode and during the morning part of the generating mode. The impact of the exposed shoreline in Monticello reservoir would be limited since the water level lowering will be about 4-1/2 feet. The adverse effects on the Davis Plantation would be the change from rolling, wooded hills in the background to a broad water view of Monticello reservoir. The nearest points of the Monticello reservoir (the 425-foot contour) would be approximately 1,000 feet from the plantation. While the change in view would be unalterable, the effects of the fluctuation could be mitigated and the reservoir edge softened by plantings (bald cypress and several species of

The South Carolina State archaeologist, Dr. Robert Stephenson, indicated four recorded archaeological sites in or near the boundary of the proposed project, none of which would be inundated. The density of these sites and the findings of occasional artifacts, such as arrowheads, in the project area indicate the probability of other such sites. The Applicant has donated \$10,000 to the University of South Carolina Institute of Anthropology and Archaeology for excavation of two of the four known sites and for a detailed survey of the project area to determine whether additional sites exist and if detailed excavation and analysis are warranted.

# 5. UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

#### 5.1 ON THE HUMAN ENVIRONMENT

The displacement of as many as 25 families and five cemeteries would be the most significant adverse human impact caused by construction of the project. The loss of approximately 700 acres of agricultural lands would be a less serious impact, since farming in the area is usually for supplemental income. There would also be a loss of approximately 3 percent of the counties' forested lands. The influx of construction workers would create a strain on area service systems, and cause the disorderly growth of trailer parks and some undesirable businesses in a rural area without the zoning controls to cope with such problems.

During construction and for several years thereafter, the effects on the scenic and aesthetic qualities of the area would be noticeable, especially in the area of the Davis Plantation and Monticello Church. The visual impact of mud flats created by the fluctuating reservoirs would last until these areas are successfully seeded with amphibious plants.

The value of lost archaeological sites is difficult, if not impossible, to assess. A detailed survey would be required to determine their existence and nature. Whenever land is flooded, however, there is risk of losing unknown sites.

No known metallic resources are present in the project area, but construction materials such as sand and gravel deposits would be lost.

Some degree of dust and noise pollution would be unavoidable, transitory effects associated with the construction of the project. Good construction practices, normal rainfall, and the nature of the soil and its ground cover could minimize the dust problem.

The remoteness of the project, intervening forests, and the low population density of the area should keep the construction noises at a low pitch for the human population. The adverse impacts of noise on animal populations would be of temporary duration.

5.2 ON WATER QUALITY

During the construction phase, erosion of disturbed areas would result in increased turbidity and siltation of the Broad River in the vicinity of the Parr dam and downstream. Some erosion of banks would occur during the early stages of operation of the combined projects. The extent to which erosion of disturbed areas occurred would be dependent upon the amount of rainfall and the effectiveness of erosion control measures taken during this period. In any event, the disruption of existing water quality, due to runoff from disturbed areas and erosion of banks, would probably be of short duration.

Operation of the Virgil C. Summer nuclear station would entail the use of project waters (Monticello reservoir) for condenser cooling, and the discharge of heated

effluent into the reservoir. Chemicals from the nuclear station would reach Monticello reservoir and eventually the Broad River. All discharges (thermal and chemical) to the aquatic environment must meet applicable South Carolina water quality standards and should not have any significant detrimental effects on the aquatic life. The cumulative or synergistic effects of these discharges, however, is presently unknown, but could be measured during the operation.

No significant unavoidable adverse effects on water quality are foreseen due to operation of the redeveloped Parr hydro station and the Fairfield pumped storage facility. The Parr reservoir would not stratify thermally, due to the daily drawdown and mixing of reservoir water with that from Monticello reservoir through operation of the Fairfield facility. Surface discharge of heated effluent from the nuclear station would enhance stratification in Monticello reservoir. Since subsurface waters would be withdrawn from Monticello for operation of the Fairfield facility, a slight oxygen deficiency could occur in the Parr reservoir and possibly downstream in the Broad River.

#### 5.3 ON FISH AND WILDLIFE

Approximately 9,400 acres of wildlife habitat would be inundated as a result of increasing the height of the Parr dam and creation of the Monticello reservoir for the Fairfield pumped storage facility. For relocation of the Duke power line and construction of the Fairfield-Summer tieline, approximately 80 acres of land would be required. These

activities would result in displacement of wildlife to adjacent areas, thereby upsetting any existing balanced ecosystems, but the extent and severity of this disruption is presently unknown. Transmission line rights-of-way would create edge habitats which could provide for a more diverse fauna.

Some 15 miles of poor quality stream fish habitat would be inundated as a result of construction and operation of the project. Enlargement of Parr reservoir is not expected to result in an increased carrying capacity of fish due to the daily fluctuating water level. Organic production in the littoral zone would be reduced and spawning success of centrarchids would be curtailed.

Mortality of some larger organisms (i.e., fish) could occur from physical injuries caused by passage through the pumped storage pump-turbines, to and from Monticello reservoir. Fish screens would be impractical on the intake structure of the pump-turbines, due to high flow rates, and would probably cause greater fish losses due to impingement.

Organisms (particularly plankton) entrained in the cooling water during withdrawal from Monticello reservoir and pumping through the condensers of the Virgil C. Summer nuclear plant would be subjected to mechanical and thermal stresses, and many, if not all, would perish, especially during the warmer months of the year. AEC Staff has estimated that under the worst temperature conditions as much as 33,000 tons might be destroyed during May - September, or about 220 tons daily. Plankton forms are usually short lived, and heavy mortalities to populations occur under certain natural conditions, including exclusion of light by turbid water, overpopulation, and extreme changes in water temperature.

# 6. RELATIONSHIP BETWEEN LOCAL AND SHORT-TERM ENVIRONMENTAL USES AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.

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The short-term environmental use of the project site has been considered to be a 50-year period. Although the proposed nuclear unit could have an operating period of 40 years, the operating life of the entire power complex would be indefinite.

The short-term use of the environment would include a number of disruptive elements. The inundation of 2,550 additional acres of land by enlargement of the existing Parr reservoir and construction of the 6,800-acre Monticello reservoir would result in the relocation of as many as .25 families and loss of forest and agricultural resources and wildlife habitat. The construction of roads, project structures, and transmission lines would be disruptive both during building and operating periods. Construction would preclude use of project lands for other purposes for as long as the project lasted.

Long-term benefits include generation of power to meet a growing consumer demand, tax revenues for governmental uses, permanent job opportunities for plant maintenance and operation, and expanded recreational facilities.

Long-term benefits in human consideration would be enhanced by the Applicant's proposed land management program for project land and water resources. Thus, for example, provisions for enlarged recreational areas . .

## 7. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Numerous resources would be used in the construction and operation of the Fairfield facility, including land, material, and supplies; water from the river; and human skill and labor, as well as capital. Some of these resource commitments would be irreversible and irretrievable, such as the construction materials and supplies which could not be salvaged after their use. In addition, water would be lost through evaporation from both Parr and Monticello reservoirs.

The only known economic mineral resources in the vicinity are sand and gravel deposits in the Broad River flood plain and the gravel quarry on Rocky Creek. Commercial dredging of these materials has been conducted a few miles upstream from the Parr reservoir until recently. Within 10 to 15 miles of the site is a noncommercial kyanite deposit at Little Mountain; a proposed granite quarry operation is located downstream on the Broad River. However, it appears that no economic mineral resources underlie the site, and loss of mineral resources due to construction and operation of the Fairfield facility would, therefore, be negligible. Should such resources exist, the project would not preclude their exploitation by future generations.

Other resource commitments such as the use of land for construction operations would only be temporary, and the lands could be returned to former or other uses following construction. When the useful lifetime of the project is completed, it would be possible to remove structures, drain the impoundment, and replant trees. While this would essentially return the area to a natural condition, it is doubtful that this would ever be done. Thus, the elimination of forest land, particularly the hardwood forest land and its associated wildlife habitat to be flooded by Parr and Monticello reservoirs, would be an irretrievable commitment of resources.

#### 8. ALTERNATIVES TO PROPOSED ACTION

The purpose of the redeveloped Parr-Fairfield project is twofold: To provide the Applicant with 518.4 mw of new peaking generating capacity; and to provide a source of condenser cooling water for the 1,800-mw Summer nuclear steam-electric plant, 900 mw of which is authorized by the Atomic Energy Commission and is presently under construction. This peaking capacity and cooling capability could be supplied from alternative sources; however, the location of the nuclear plant is fixed, and therefore its cooling system must be located nearby. The Parr-Fairfield project and the Summer nuclear station were conceived and designed as an integral generating complex. 8.1 COOLING CAPACITY

"If a license for the redeveloped Parr-Fairfield project were not to be issued, then the Applicant would have to apply to the Atomic Energy Commission for authorization to construct an alternative condenser cooling system, in order to meet its scheduled completion date of 1977 for the first unit of the Summer plant. Such an application would consist of a specifically proposed alternative, an environmental impact report on this alternative, and a preliminary safety analysis of this proposed alternative.

If the staff of the AEC should then determine that this alternative would have a significant environmental impact, a revision to the AEC's final environmental impact

statement on the Summer nuclear plant would be required. Possibly, the hearing on the nuclear plant would have to be reopened.

Alternative type cooling systems for the Summer nuclear plant would include mechanical draft evaporative towers, natural draft evaporative towers, a spray cooling pond, and a nonspray cooling pond.

## 8.1.1 Mechanical Draft Evaporative Towers

Mechanical draft evaporative cooling towers use powered fans to blow air upward or across flowing water. The towers would be grouped in structures about 30 to 40 feet in height. Cooling takes place largely by evaporation of part of the water. The total capital cost for cooling two 900-mw nuclear units would be about \$30,600,000, or \$17 per kw. Total annual operating costs, assuming an 80 percent plant factor, would be about \$3,400,000,or 0.27 mills per kwh. Water loss due to evaporation would be about 32,000 acre-feet annually. This amount of localized evaporation would have a potential for creating low-level fog in the immediate surrounding area.

#### 8.1.2 Natural Draft Evaporative Towers

Natural draft evaporative cooling towers are large hyperbolic structures designed to create a flow of air through the water by means of the chimney effect created by a difference in density between internal and external air. The towers are very large, as much as 400

feet high and 400 feet in diameter at ground level. They would create a fog plume at high altitudes, which could carry downwind for several miles. The total capital cost for cooling two 900-mw nuclear units would be about \$43,200,000, or \$24 per kw. Total annual operating costs, assuming an 80 percent plant factor, would be about \$2,500,000, or 0.20 mills per kwh. Water consumption would be about 27,000 acre-feet annually.

8.1.3 Spray Cooling Pond

A spray cooling pond utilizes pumps and nozzles to spray the condenser cooling water into the air, increasing evaporation and releasing heat to the atmosphere. The water is recirculated in a relatively small pond. Ground fog formation (somewhat similar to that experienced with mechanical draft towers) with some downwind drift would be expected at certain times, depending on atmospheric conditions. The total capital cost for cooling two 900mw nuclear units would be about \$32,400,000, or \$18 per kw. Total annual operating costs, assuming an 80 percent plant factor, would be about \$3,400,000, or 0.27 mills per kwh. The pond would require an area of about 120 acres. Water consumption would be about 29,000 acrefeet annually.

# 8.1.4 Nonspray Cooling Pond

A nonspray cooling pond would recirculate water in a similar manner to the proposed Monticello reser-

voir; however, it would require a surface area of about 3,200 acres, as compared to 6,800 acres for the proposed Monticello reservoir. Annual water consumption would be about 34,000 acre-feet. The total estimated capital cost for cooling two 900-mw nuclear units would be about \$27,000,000, or \$15 per kw. The total annual operating cost, assuming an 80 percent plant factor, would be about \$600,000, or .05 mills per kwh.

8.2 GENERATING CAPACITY

Possible alternatives to the proposed project, assuming adequate condenser cooling facilities would be provided for the Summer nuclear plant, would include (1) no further increase in capacity, (2) power purchased from other systems, (3) nuclear-fueled steam-electric generating plants, (4) coal-fueled steam-electric generating plants, (5) oil-fueled gas turbines, (6) conventional hydroelectric plants, (7) other pumped storage projects, (8) a modified Fairfield Project, and (9) conservation of energy.

8.2.1 No Increase in Capacity

The Applicant will need new sources of generating capacity in future years. Staff's studies of the Applicant's system show the need for additional electric power. The annual growth rate in peak demand has been projected as 11.3 percent, which approximates the historic annual growth rate during the 5-year period from 1965 to 1970. This projection, along

with planned capacity additions, is shown in Table 1-1. Even if the projected need for electric power is reduced by conservation practices, the system would still be expected to grow, although at a slower rate.

Not to expand system generating capacity would result in the Applicant being unable to provide an adequate, reliable source of power to its customers. The theoretical alternative of no further additions to Applicant's overall generating capacity is, therefore, considered as not being feasible.

8.2.2 Purchased Power

The Applicant has a purchase agreement with Carolina Power and Light Company for 140 mw of generating capacity from the Sutton No. 3 generating unit, which terminates May 1, 1977. After that date, there appears to be no foreseeable surplus of capacity available from neighboring systems.

The southeastern region of the United States, which includes the Applicant's system, is experiencing load growth rates substantially greater than the national average. The Southeastern Electric Reliability Council report to the Federal Power Commission shows that projected load forecasts and planned generating capacity instal-

lations through 1990 will not provide any significant surplus generating capacity which could be made available for the Applicant's system under a long-term purchase agreement.

Purchase of power from neighboring power systems would not provide a viable long-range alternative.

#### 8.2.3 Baseload Nuclear-Fueled Steam-Electric Plant

A baseload nuclear-fueled steam-electric plant would provide the Applicant with a large block of capacity operating at a high plant factor, probably on the order of 70 percent over its lifetime. Because of its low fuel cost, it would displace older fossil-fueled plants, which would then operate fewer hours on the system load, or would stand by as system reserves.

Construction of a nuclear-fueled plant would require securing Federal, State, and local licenses and permits requiring the meeting of stringent safety and environmental standards. The nuclear plant site would require an adequate supply of cooling water and a cooling system that would meet environmental temperature standards.

The estimated capital cost of nuclear generating capacity equivalent to the Fairfield plant would be about \$143,000,000, or \$297 per kw. This includes the fixed nuclear fuel cost, and the estimated cost of the condenser cooling system. The estimated variable operating and fuel costs would be about 2.00 mills per kwh.

# 8.2.4 Baseload Coal-Fueled Steam-Electric Plant

A baseload coal-fueled steam-electric plant would provide the Applicant's system with a comparatively high efficiency source of generating capacity. It would operate at a high plant factor during its early years and would have a lifetime average plant factor of from 50 to 60 percent. These steamplants are available in a wide range of unit sizes, operating temperatures, and pressures to accommodate most system needs.

Construction of a coal-fueled plant would require securing State and local licenses and permits and finding an adequate water supply and available adequate fuel transportation. Detrimental effects of a coal-fueled base load plant would include air pollution from stack emissions, the depletion of fossil-fuel resources, consumptive use of water by cooling towers, and in the absence of cooling towers, heated water discharges. The construction and operation of a thermal unit would also have an adverse aesthetic impact. Adverse impacts to scenic values would be caused by the construction of cooling towers, smoke-stacks, new transmission lines, stack discharges, and fuel storage areas.

The estimated capital cost of coal-fueled generating capacity equivalent to the Fairfield plant

would be about \$91,200,000,or \$190 per kw. This includes the estimated cost of the cooling system and electrostatic precipitators, but not the cost of sulfur removal equipment. The estimated variable operating and fuel cost would be about 6.24 mills per kwh.

# 8.2.5 Oil-Fueled Gas Turbines

Oil-fueled gas turbines would provide the system with a peaking source of power in contrast to nuclear and coal-fueled steam-electric plants which would provide base load capacity. Gas turbines have a relatively low capital cost, are quick-starting compared to steam-electric plants, are adaptable to a wide variety of site locations, and are feadily automated. Typically, these plants include provision for remotely controlled unattended operation and are furnished with a self-contained cooling system and weatherproof They are equipped to burn either liquid housing. petroleum fuels or natural gas, and may be installed to burn either fuel interchangeably. These units can be started, synchronized, and loaded automatically within 5 to 20 minutes. On a typical utility system load, they would operate 500 to 1,000 hours per year and serve as ready reserve when shut down.

Disadvantages of gas turbines would include the consumption of fossil derivative fuels currently in short supply; low efficiency; high operation and maintenance costs, making them uneconomic for generating large amounts of energy; high noise levels; and introduction of combustion by-products into the atmosphere. Gas turbines are less reliable than conventional hydro or pumped storage hydro units for quick starts in emergency situations. Recent shortages could also decrease the reliability of this type of fuel supply.

The estimated capital cost of oil-fueled gas turbine capacity equivalent to the Fairfield plant would be about \$57,900,000, or \$121 per kw, including the cost of oil storage tanks at the sites. The estimated variable operating and fuel costs would total about 15.32 mills per kwh.

## 8.2.6 <u>Comparison of Annual Costs of Thermal Generating</u> <u>Alternatives</u>

Table 8-1 shows the Staff's comparison of annual costs between the Fairfield plant and each of the three thermal generating alternatives listed previously. The annual costs are shown for the year 1982, the year that the second Summer nuclear unit is expected to be available to supply additional low cost pumping energy for the Fairfield plant. In common with all pure pumped storage developments, the Fairfield plant would require about 1.5 kwh of pumping energy for every kwh of energy generated on the system load. In 1982 it is estimated that 80 percent of this pumping energy would be supplied from nuclear-fueled plants and 20 percent from coalfueled plants.

The cooling water benefit of the Fairfield development has been subtracted from the cost, reflecting that if Fairfield were not built, the cost of an alternative cooling system for the Summer nuclear station would have to be added to the cost of the alternative thermal capacity built to replace Fairfield.

Table 8-1 shows that when the power generation costs and the cooling water benefits of the Fairfield development are considered together, they show an annual savings of \$1,849,000 over the next most economical alternative, gas turbine capacity.

8.2.7 Hydroelectric Alternatives

The Applicant and the FPC staff studied several hydroelectric conventional and pumped storage sites to determine their suitability for development as alternatives to the Fairfield project. The Applicant's study was of its service territory while the FPC Staff study included both the service territory and the adjacent area up to a distance of about 120 miles from the Fairfield site.

The Applicant's alternative sites were selected for suitability as multi-generation complexes with the view of concentrating thermal and hydro generating plants

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	Fairfield	Nuclear	Coal	Gas Turbine
Energy (800,000 mwh)	\$ 3,418 <u>1</u> /	\$ 1,600	\$ 4,992	\$ 7,569
Capacity (480 mw)	16,347	23,191 <u>2</u> /	16,714	2/ 9,148
Cooling Benefit (1,800 mw)	-4,897			
TOTAL	\$14,868	\$24,791	\$21,706	\$16,717
Savings, Pumped Hydro	<b>-</b>	\$ 9,923	\$ 6,838	\$ 1,849

# (Table 8-1 Comparison of Annual Costs for 1982 (Thousands of Dollars)

1/ Cost of 1,200,000 mwh of pumping energy.

2/ Includes separate nonspray cooling pond.

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together to minimize environmental impact, especially relocations, service roads, and transmission lines. Besides the Fairfield site, the Applicant considered a site on the adjacent Little River a few miles southeast of Parr, and the Blair site on the Broad River 11 miles upstream from Parr dam.

(a) <u>Blair</u>. This site is on the main stem of the Broad River and is potentially both a conventional and pumped storage hydro development. The scheme considered by the Applicant would require a reservoir area of 21,430 acres and would develop a head of about 50 feet. Besides the relatively low head, disadvantages of this site are the necessity of extensive relocations and the difficulty of meeting thermal discharge regulations if the reservoir were used as a thermal plant cooling pond.

(b) Little River. This site would require an upper reservoir off the main stem of the Broad River and is similar to the Fairfield site with regard to environmental impact, except that it does not make use of an existing hydroelectric development for the lower reservoir. Also, the cooling surface area of the upper reservoir would be somewhat smaller than Fairfield's, thus providing less cooling capacity.

The FPC Staff studied potential conventional and pumped storage hydroelectric sites located within a radius of about 120 miles of Parr dam. None of the sites located

within the Applicant's service area are economically feasible for development. The Greater Lockhart site was the most economical potential site studied within the Applicant's service area. The site is located on the Broad River about 30 miles north of the Parr project and would be developed as a combination conventional and pumped storage hydroelectric project, with an installed capacity of 250,000kw conventional and 750,000-kw pumped storage. The estimated capital cost of the Greater Lockhart project would be about \$312,000,000, including transmission lines, or about \$312 per kw. This compares with the estimated capital cost of \$220 per kw for the Fairfield development.

The most economical alternative sites studied are located within the service area of the Duke Power Company, 85 to 120 miles from Parr Shoals, where the mountainous topography would permit high head development. Many of these sites will be needed in the future as the load requirements of the Duke Power Company and other neighboring utilities increase.

# 8.2.8 Fairfield Project with Small Upper Reservoir

The Department of the Interior has suggested, as an alternative to the proposed project, the use of a smaller upper reservoir for pumped storage and make-up water along with cooling towers for the two 900-mw Summer nuclear units.

The staff has studied this possibility by modifying the proposed project with the objective of reducing the size of Monticello Reservoir from 6,800 acres to about 1,200 acres. The smaller upper reservoir would be formed by a long dike extending east from the proposed Fairfield intake structure to a point just west of the community of Jenkinsville, enclosing the southern end of the proposed Monticello Reservoir.

The smaller reservoir would require live storage of about 32,000 acre-feet, compared to 29,000 acre-feet for the proposed project, to compensate for a lower average operating head between the two reservoirs. The size of Parr Reservoir would be increased by about 200 acres to provide this additional live storage, so the net decrease in land use would be about 5,400 acres.

The smaller reservoir would require about 68 percent more earth volume for the dams. The drawdown for the smaller upper reservoir would be about 33 feet, compared with 4.5 feet for the proposed Monticello Reservoir. Despite the

savings in land area, this scheme would be about 12 percent higher in capital cost, chiefly due to additional earthwork and slightly larger capacity turbines and waterways.

The main disadvantage of the small reservoir alternative is that it provides no cooling water benefit to the Summer nuclear station, since a cooling tower system would have to be constructed to avoid unacceptable temperature increases in the Broad River. This cooling water benefit is estimated as about \$4.9 million per year, as shown in Table 8-1, and gives the proposed Fairfield project its economic advantage over other alternatives. The small reservoir scheme would not have this benefit, and consequently is economically unattractive.

### 8.3 CONSERVATION OF ENERGY

During the next two decades a program for conservation of electric energy must focus principally on modifying traditional patterns of energy use toward reduced energy requirements. Although of long range importance, further improvements in generation and equipment efficiencies will come slowly, and many years will elapse before such improved equipment could constitute a sufficiently large proportion of the total to significantly raise the average efficiencies of generation and utilization.

The Federal	Power Comm	ission in	its 1970 Nat	ional Power
Survey projected	the growth	in power	requirements	and installed
generating capac:	ity through	the next	two decades	as follows:

· .	1970	1980	1990
Installed Capacity (millions of kw)	340	665	1260
Energy Demand (trillions of kwh)	1.6	3.2	6.0
Population	203,235,298	227,765,000	251,431,000
Energy per Capita (kwh)	7,950	13,780	22,450

The 20-year projection (through 1990) indicates an annual growth rate in electrical energy demand amounting to about 6.7 percent, but it does not specifically consider the effect of a national commitment to energy conservation. The Staff knows of no comprehensive validated analysis of potential electrical energy savings from conservation measures, but notes that most speculative estimates appear to be in the range of a 5 to 7 percent reduction, which might be achieved in 5 to 10 years. These estimates are for voluntary conservation measures, not for a forced program of energy-use reduction with restrictions on kinds of energy use, embargoes on sale of electric equipment, or similar measures which might be employed in a power emergency. Some electric utilities have promoted conservation programs and report a degree of success. Thus, for example, Consolidated Edison in the New York Metropolitan Area was faced with heavy demands for peak power and inadequate generating capacity, and launched a "Save a Watt" campaign. It was partly a voluntary promotional effort aimed at greater conservation in the use of electrical energy, and together with a voltage reduction of about 5 percent reportedly resulted in reducing the summer peak load by as much as 400 mw. This was about 5 percent of the peak load and may have prevented power failures in New York. Though it might be difficult to sustain such load reductions indefinitely, the promotional campaign apparently had some success in limiting power demands.

Utility promotional efforts aimed at conservation are therefore desirable. Conservation-conscious operation of ranges, dishwashers, and laundry facilities; better use of heating and air conditioning equipment through stabilized settings of thermostats; effective insulation and use of storm windows; improved lighting practices--these are some of the ways the consumer can be encouraged to save in the home. Similar potential savings exist in office buildings, stores, and industrial plants.

There are economic and environmental-protection benefits from energy conservation that can be directly rewarding to individuals. As consumers waste less power and more efficiently use what is available, they reduce the monthly electrical bills. As a consequence of reduced generation, atmospheric emissions and waste heat discharges are less.

Though conservation cannot eliminate growth in energy demand and the need to expand electric generating capacity, Staff believes that conservation practices have the potential of reducing the annual growth rate by perhaps one point--that is, from the projected 6.7 percent to 5.7 percent--at the end of the next decade. Such savings could effect a significant reduction in the need for new generating capacity during that period.

# DISCUSSION OF COMMENTS ON DEIS

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Notice of availability to the public of the Draft Environmental Statement was published and copies were mailed to appropriate Federal, State, and local agencies for comment on September 7, 1973.

Comments were due on October 22, 1973. Staff began preparing its Final Environmental Impact Statement on December 1, 1973.

Comments were received from:

FEDERAL AGENCIES

Department of Agriculture, U.S. Forest Service

Department of Army, Chief of Engineers

Department of Commerce

Department of Health, Education, and Welfare Department of Housing and Urban Development Department of the Interior

Department of Transportation, U.S. Coast Guard REGIONAL AGENCIES

Central Midlands Regional Planning Council STATE AGENCIES

Department of Agriculture

Department of Archives and History

STATE AGENCIES (Cont.)

· Forestry Commission

· Highway Department

Office of Economic Opportunity

Water Resources Commission

LOCAL AND OTHER PARTIES

South Carolina Electric & Gas Company

South Carolina Environmental Coalition.

Copies of the letters of comment received are provided in Appendix 6.

Comments received from the various agencies on their review of new environmental matters or those discussed in the DEIS have been considered in finalizing the EIS. Only those agency comments requiring response are summarized in this Section, followed by the appropriate response thereto.

U. S. Department of Agriculture, Forest Service Comments on the environmental statement in the U.S. F.S. letter of January 10, 1974, are discussed in the text of the FEIS.

U.S. Department of the Interior, Office of the Secretary

Comment a: Interior finds it difficult from a recreational standpoint to assess the environmental effects of this proposal because Interior does not consider the Exhibit R to be acceptable. Interior urges the Commission to require the Applicant to develop an acceptable Exhibit R as soon as possible and hopefully before the final environmental impact statement is developed for this project.

<u>Response a</u>: Section 10 of the FEIS describes procedures to provide adequate public recreational opportunities and the capability of expanding those features.

<u>Comment b</u>: Concerning geology and physical features as set forth in Section 2.2, the following points are noted: (1) transmissivity of geological materials beneath the dams impounding the upper reservoir and implications of seeps and springs below one or more of the dams; (2) analyses of embankment deformation and the limit of settlement that could be tolerated without danger of internal cracking of the embankments; (3) dynamic stability of the embankments in relation to local soil conditions; and (4) stability of natural slopes at the construction sites. Assurances should be given that these points have been adequately considered either in the environmental statement of the nuclear plant or the safety analysis report for that plant; Interior therefore suggests reference to the pertinent documentation in the final environmental impact statement.

<u>Response b</u>: Details of the project's geologic data are contained in <u>Geologic and Seismic Report</u>, <u>Parr Hydroelec-</u> <u>tric Project</u>, <u>FPC Project No. 1894</u>, South Carolina Electric & Gas Company, a copy of which is in the public files of the Federal Power Commission.
The engineering staff of the FPC has reviewed the general design drawings of the project structures, including the earth embankment and foundations, and has concluded that the design is safe and adequate. In addition, as indicated in Section 10, an independent board of consultants will review the project design and will make periodic inspections and reports during all phases of construction. Finally, the Commission staff and the board of consultants will review the project prior to the initial filling of Monticello Reservoir.

9-4

<u>Comment c</u>: Concerning the discussion of water quality in Section 2.4, there is no indication that chemical analyses have been made for the detection of heavy metals in the Broad River. Data taken by the South Carolina Pollution Control Authority at Parr on December 8, 1971, revealed the presence of chromium, lead, and mercury at more than trace levels. The potential concentration of these pollutants in Parr reservoir, Monticello reservoir, and the recreational subimpoundment, and the effects of heavy metal concentrations on the biotic community and recreational potential should be discussed in this section.

Response c: Additional information has been incorporated into section 2 of the FEIS.

<u>Comment d</u>: Section 2.4 should also discuss the loss of reservoir storage capacity because of sedimentation. The potential loss of pumped storage capacity and thus project benefits should be adequately treated. <u>Response d</u>: Sedimentation in Monticello subimpoundment from Frees Creek will not present a problem because of the very small tributary drainage area involved. The amount of sedimentation in Monticello reservoir caused by pumping of turbid waters from Parr Reservoir is not known, although the large amount of dead storage space should prevent a loss of useable storage.

Sedimentation in Parr reservoir has been a significant factor in reducing reservoir capacity in the past. However it is estimated that an equilibrium condition has been reached, and any further sedimentation of the proposed live storage space will be prevented by the functioning of the Bascule gates at Parr dam. Natural floods will be passed down the Broad River by lowering one or more of the Bascule gates and permitting high river velocities to pass any additional sediment over the dam.

<u>Comment e</u>: Section 2.5 should present a detailed discussion of the various vegetative types that will be inundated, together with their acreage and distribution. The statement that creation of Monticello reservoir will inundate about 6,000 acres of pine-forested land is misleading. Actually the site supports about 3,000 acres of bottom land hardwoods and mixed pine-hardwood stands and about 3,000 acres of pine plantation.

<u>Response e</u>: This information has been incorporated into Section 2.5 of the FEIS. Detailed information can be found in Appendices D and H.

<u>Comment f</u>: In Section 2.8 of fish and wildlife, the final statement should identify the quantity and quality of fish and wildlife habitat to be affected by project implementation. Discussions should also indicate relative abundance and population densities for game and nongame wildlife species indigenous to the project area.

<u>Response f</u>: Additional information is furnished in Appendices D and H of the FEIS.

<u>Comment g</u>: This portion of the FEIS should also recognize white-tailed deer as the most important big game species in South Carolina and one of the primary game species within the project area. The abundance of escape cover and herbaceous and woody browse plants within the bottom lands, plus the mast production in the mixed stands and the interspersion of uneven-aged timber stands, help make this excellent habitat and this is responsible for the maintenance and productivity of deer populations.

Response g: This suggestion has been incorporated into Section 2 of the FEIS.

<u>Comment h</u>: In Section 3 on the environmental impact of the proposed action, the second paragraph on page 3-1 should be deleted in the final environmental impact statement. Interior does not agree that the proposed boat launching ramp with its 10 parking spaces and the recreational subimpoundment will offer unique features in Fairfield County. Interior agrees that the scenic overlook will provide the first area view of a combination pumped storage and cooling impoundment, but questions the influence of this facility on overall recreational activities. Furthermore, there is no evidence to support the presumption that sport fishery populations will be increased by construction of this project.

<u>Response b</u>: The word"unique"was neither used nor implied to describe the proposed recreational facilities.

The 300 acre subimpoundment is to be managed exclusively for sport fish species and should provide for increased populations of these species. Presently the Broad River within the project area is not being managed for sport fish production and the quality of the fishery is classed as very poor, due largely to the turbidity of the water.

<u>Comment i</u>: In Section 3.2 on fish and wildlife, the inundation of 2,550 acres of bottom lands by enlargement of Parr reservoir and the further inundation of about 3,000 acres of bottom lands and mixed pine-hardwoods by construction of Monticello reservoir will result in significant losses of wildlife habitat and a severe reduction in the carrying capacity of area lands for most native wildlife species. Contrary to the discussion in the DEIS, the displaced wildlife species would not be absorbed by the surrounding habitat.

9-7.

Response i: It is Staff's opinion that any areas which have populations below carrying capacity might be able to support displaced wildlife without having a significant impact on the resident species. Carrying capacity of surrounding areas could be increased by proper management practices. However, Staff does not have data to make specific conclusions.

<u>Comment j</u>: More specifically concerning Section 3.2, the bottom land and mixed hardwood sites provide a majority of the foods, especially winter browse, as well as escape cover for the white-tailed deer. It is biologically misleading to suggest that destruction of about 6,000 acres of these vegetative types will not severely decrease the area carrying capacity for this species. South Carolina bottom lands support an estimated 1 deer per 13 acres, while loblolly pine-hardwood and longleaf pine support 1 deer per 30 to 50 acres and 73 acres, respectively. Therefore, bottom lands are three times as valuable as the higher elevation forest types for deer production.

<u>Response j</u>: Staff is unable to find anywhere in Section 3.2 of the DEIS where it is suggested that destruction of about 6,000 acres of wildlife habitat will not severely decrease the area's carrying capacity for deer.

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<u>Comment k</u>: Interior also notes that the DEIS has failed to recognize the effects of this proposal on waterfowl populations in the project area. The destruction of vegetation and the daily water level fluctuations in 2,550 acres of bottom lands adjacent to Parr reservoir will preclude any significant waterfowl usage. Of particular importance is the potential destruction of valuable nest sites for the wood ducks. This section should also recognize the proposed inundation of 235 acres of U.S. Forest Service lands that have been proposed as a waterfowl management area, and the Dawkins Wildlife Management Area that has been managed by the South Carolina Wildlife and Marine Resources Department for about 13 years.

Response k: Refer to sections 3 and 10 of the FEIS.

<u>Comment 1</u>: This section indicates the importance of the striped bass fishery downstream of the project, but no data are given on the downstream flows to be released by the Applicant to insure the continued production of resident and anadromous fish species. These data should represent both quantitative and qualitative aspects below Parr dam.

<u>Response 1</u>: Refer to Sections 4 and 10 and Appendix A of the FEIS.

<u>Comment m</u>: In Section 4 on measures to enhance the environment or to avoid or mitigate adverse environmental effects, Interior suggests that 4.2 on land management should be deleted from the final statement until such time as the

Applicant and the Commission can present detailed and comprehensive discussions of the measures proposed by the section title. It is unreasonable to assume that enumeration of vague biological monitoring programs and fish and wildlife management schemes can be considered as environmental enhancement or mitigation of adverse effects. Proposed biological studies should be finalized and reviewed by the appropriate State and Federal agencies prior to completion of the final statement.

<u>Response m</u>: The purpose of the proposed monitoring programs is to determine existing resources to aid in formulating more specific management programs for mitigating some resource losses. Should a license be granted, final plans would then be developed, in some cases even after construction, when losses and needs could be more clearly delineated.

<u>Comment n:</u> The South Carolina Pollution Control Authority has placed restrictions on the use of Monticello reservoir to exclude bank fishing, primitive camping on islands, or water contact sports. Therefore, the statement that recreational facilities and activities compatible with the area's needs will be enhanced is totally misleading. Furthermore, the limited project lands around the reservoir sites, the large daily fluctuations in Parr reservoir, and the exclusion zones around the nuclear and powerhouse facilities would severely

limit recreational opportunities at the project site.

<u>Response n</u>: Definite limitations will exist due to (1) South Carolina Pollution Control Authority's restrictions on the use of Monticello reservoir, (2) the proposed fluctuation of Parr and Monticello reservoirs, and (3) the exclusion zones around the nuclear and powerhouse facilities. Nevertheless, recreational development as outlined and suggested in Section 10 of the FEIS will provide recreational facilities and activities that are compatible with area needs, and will adequately meet area demand.

Regarding the present classification of Monticello reservoir waters, which restrict water contact sports on the reservoir, Applicant indicated on page R-1 of its Amended Application for New License, filed July 26, 1972, that after reservoir filling, it will seek approval from the South Carolina Pollution Control Authority and the South Carolina State Health Department for public use of the major portion of Monticello reservoir. If the classification of Monticello reservoir was changed to allow water contact sports, normal project operations would allow canoeing, rowing, primitive camping, picnicking, and fishing on a major portion of the 6,800 acre reservoir and its islands.

The recreational opportunities in Parr reservoir will be severely limited due to extreme daily fluctuations.

There will be ample project lands around the reservoir sites that will provide adequate recreational opportunities. Applicant has proposed a total recreational development that includes a 300-acre subimpoundment and 1,116.5 acres of land for recreational use.

The exclusion zones around the nuclear and powerhouse facilities will not severely limit recreational opportunities at the project site. The Atomic Energy Commission's regulations (10 CFR \$100.3(a), 1973), defines exclusion area as "that area surrounding the reactor, in which the reactor licensee has the authority to determine all activities including exclusion or removal of personnel and property from the area. This area may be traversed by a highway, railroad or waterway... provided appropriate and effective arrangements are made to control traffic on the highway, railroad, or waterway, in case of emergency, to protect the public health and safety." The regulations further state that "activities unrelated to operation of the reactor may be permitted in an exclusion area under appropriate limitations, provided that no significant hazards to the public health and safety will result " (10 CFR \$100.3(a), 1973).

<u>Comment o</u>: Interior further referred to Section 4 as it pertains to the proposed mitigation measures of minimum flow releases from Parr dam and the dedication of a 90-acre greentree reservoir site. The minimum flow designation cannot be considered as mitigation, but is instead a project design feature to avoid downstream fishery losses. As stated previously, there are no data to suggest that these minimum releases would be sufficient to accomplish the intended purpose. The proposed greentree site has little or no mitigation value for the inundation of 235 acres of U. S. Forest Service lands slated for waterfowl management and the destruction of about 9,000 acres of productive wildlife habitat. Interior suggested various mitigation measures to the Applicant and the Federal Power Commission in a June 15, 1973, letter. These and additional measures should be given utmost consideration in the preparation of the final statement.

Response 0: There is no proposed site for the greentree reservoir. Instead, the site will be determined after the filling of the reservoirs. Furthermore, the Applicant and the U. S. Forest Service have entered into a memorandum of agreement (attached to the Forest Service letter of December 20, 1973, in Appendix F) to mitigate losses that would be incurred by construction of the proposed project.

Since "mitigate" means "to moderate, to make less severe," maintenance of downstream flow releases to provide sufficient water for existing fisheries is a "mitigation measure." The memorandum of agreement between SCE&G and South Carolina Wildlife and Marine Resources (Appendix A)

furthermore assures that sufficient releases will be maintained.

<u>Comment p</u>: Concerning Section 5 on unavoidable adverse environmental effects, a revision should be made in light of previous comments. The unavoidable adverse environmental effects of construction and operation of the project will be the destruction of over 9,000 acres of productive wildlife habitat, the inundation of nearly 15 miles of river and stream fish habitat, a reduction in the carrying capacity of existing Parr reservoir, and a possible reduction in productivity of downstream fisheries.

Response p: Refer to Section 5 of the FEIS.

<u>Comment q</u>: Interior suggests that the Commission give serious consideration to the inclusion and environmental assessment of a small upper reservoir alternative to that presently proposed for pumped storage and make-up cooling water. Interior's calculations indicate that the use of cooling towers for the proposed nuclear powerplants would only require about 130 acre-feet per day of make-up water. Since 29,000 acre-feet of water will be pumped into Monticello reservoir daily, the size of this reservoir could be reduced to provide only enough storage for peak generation and residual storage for make-up water. Further, a display of the environmental effects of such a proposal may well demonstrate its superiority

over the proposed project insofar as fish and wildlife resources are concerned.

Response q: A small upper reservoir alternative to the proposed project has been studied by the staff and is discussed in Section 8 of the FEIS. It is not considered a feasible alternative to the proposed project because it would have no cooling water benefits for the Summer nuclear station. Although the land requirement is much less than that for Monticello reservoir, the 33-foot drawdown of the smaller reservoir is a serious disadvantage for a body of water located adjacent to the community of Jenkinsville.

A greatly reduced Monticello reservoir would support no fisheries, whereas the proposed 4-foot fluctuation would have minimal effects on the development of a fishery in Monticello. Although water contact sports will not presently be allowed in the main part of the proposed upper reservoir, the possibility remains for such usage being allowed in the future.

In light of the possibilities of probable expanded nuclear facilities, the larger impoundment would be a better use of resources.

<u>Comment r</u>: In further discussion of this section, Interior states that the Applicant has various alternatives available for the avoidance or mitigation of adverse environmental effects. For example, the impoundment of Hellers and Cannons Creeks for waterfowl mitigation, and the resultant Response r: Any reduction in usable storage capacity in Parr reservoir would jeopardize the energy-generating benefits of the project, because the 29,000 acre-foot capacity of the lower reservoir determines the capacity of the entire project. SCE&G estimates the loss of 20 minutes generation each week-day would mean a loss of 41,600 mwh per year with a value of about \$260,000.

FPC staff studies indicate that a subimpoundment on Hellers Creek only would result in a storage loss in Parr reservoir of 1,085 acre-feet, or a 3.74 percent loss. Assuming 5 days of generation per week, this gives a loss of \$233,000 per year with a subimpoundment in Hellers Creek. If Cannons Creek were impounded also, the loss in generation would be at least twice as much.

<u>Comment 5</u>: In concluding remarks about this section, Interior recognized the need for maximum head development to meet projected peak loads. But maximum head development could be realized by the Applicant by location of a smaller upper reservoir dam site at a higher elevation in the Frees Creek Watershed. Further, Interior suggests that the final

statement identify and evaluate another alternative--the development of necessary peak load facilities in alternative locations outside the Applicant's service area. On page 8-13 of the DEIS, the FPC staff indicated that the most feasible sites studied were located in Duke Power Company's service area.

Response S: The topography of the Frees Creek Watershed precludes the development of a significantly higher head pumped storage project in the area. Any small increase in head would be more than offset by uneconomic lengthening of the waterway between the upper reservoir and Parr reservoir. Also, any small upper reservoir located in the head-waters of Frees Creek could not serve the Summer station as a source of make-up water.

# U.S. Department of Health, Education, and Welfare, Region IV Office

Comment: HEW notes an area of secondary impact which appears not to be fully clarified in the DEIS. As stated in the DEIS, a majority of the transient workers would reside in the Columbia area. In the event 30 percent resided in the project area, 7 additional classrooms would be required by the Local Education Authority (LEA). The two counties to be affected are rural and appear to have a stable school population. Consequently, HEW recommends that FPC consult with the LEA on the potential impact of additional classrooms on their physical plant facilities.

Response: The FEIS, in Section 3.2, indicates that approximately 30 percent of the work force would come from permanent residents within a 25-mile radius of the project area. Since they are already residents, they should cause no new impacts. The school age children of these families would already be in the area schools.

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Office of the Assistant Secretary, U. S. Department of Commerce

Comment: Parr project could produce adverse effects on striped bass and blueback herring spawning downstream from the development due to fluctuating water levels. The agreement between the South Carolina Wildlife and Marine Resources Department and the South Carolina Electric & Gas Company should provide for necessary flows to assure successful spawning of these species. Also, the final impact statement should include studies to monitor the spawning of these fish and the feasibility of altering flows, if necessary, during the spawning season.

<u>Response</u>: One of the major reasons for this agreement was to assure an adequate flow from Parr reservoir by South Carolina Electric & Gas for striped bass spawning, as recommended by the South Carolina Wildlife and Marine Resources Department as stated in their agreement (Appendix A). Further, staff has recommended in Section 10 of the FEIS that provision be made in any license issued for modification of the

agreed-upon flow regime should it be found to be inadequate to provide the amount of flow necessary to protect the downstream aquatic environment.

# South Carolina Environmental Coalition

Comment: A report by the Environmental Protection Agency (EPA) suggests that odor problems in the Broad River, from which the City of Columbia, South Carolina, draws its 🗧 drinking water, may be attributed to algal and fungal organisms. This report further states that as temperature increases, the activity of actinomycetes, the bacteria causing the odors, increases. The proposed Parr project would create a large warm water "sink" due to its use for cooling waters for a nuclear station, and could create ideal conditions for growth of the actinomycetes. The DEIS does not analyze the problem and ignores existing data. This is a significant problem and is directly related to the Parr project. Thorough, independent studies should be conducted before a Final Environmental Impact Statement is released.

<u>Response</u>: This comment is considered in Section 2.4 of the FEIS and the conclusions and recommendations from a 1973 Environmental Protection Agency Report concerning musty odors in the Broad River are included in the FEIS (Appendix E).

# 10. <u>DISCUSSION OF SIGNIFICANT ENVIRONMENTAL MATTERS</u> 10.1 LAND USE

Licensee should acquire in fee title, or the right to use in perpetuity, and include within the project boundary all lands other than lands of the United States necessary for construction, maintenance, and operation of the project. Lands around the recreation subimpoundment and other lands proposed for recreational development should also be included within the project boundary.

The project boundary should be as follows:

(1) The project boundary around Monticello reservoir should include any islands and all lands below the 430-foot contour elevation msl, except that the project boundary should provide a strip of land around the reservoir not less than 50 feet and generally no more than 200 feet wide from the 425-foot contour elevation. The project boundary around the Monticello reservoir subimpoundment should include a strip of land not less than 150 feet wide from the 425-foot contour elevation, together with all other lands necessary to serve project recreational purposes, including buffer zones around recreational sites.

(2) To protect the remaining wildlife habitat along the Broad River bottom lands, the project boundary around Parr should include any islands and all other lands up to the 270-foot contour elevation msl. In any case, the project boundary should include a strip of land a minimum of 50 feet wide and generally not more than 200 feet wide, together

with all other lands necessary for project recreation purposes. To maintain the benefits of a shoreline buffer strip, access should be controlled by the Licensee. Furthermore, the design of public access areas and associated facilities should be submitted for Commission approval.

No disposal of any interest in project lands or waters should be allowed without prior approval of the Commission.

Licensee should retain all project lands, works, and rights essential to the development, transmission, or distribution of power and for other project purposes. None of these should be disposed of without approval of the Commission.

The Licensee should take reasonable measures to minimize soil erosion on project lands and siltation of the project reservoir and streams. If the Commission should deem it necessary, after notice and opportunity for hearing, the Licensee should be required to construct and maintain soil surfaces.

Licensee should provide for the joint use by the United States agency having jurisdiction over any project lands, or by persons or corporations occupying United States lands under permit, of water from any stream, conduit, or any natural or artificial body of water for fire suppression.

## 10.2 RECREATION

The Applicant's amended application for a new license reports that a visitor center and construction observation point would be built on the south shoreline of Monticello reservoir. The Applicant should consult with the South Carolina Department of Parks, Recreation, and Tourism in planning the facilities, and file with the Commission appropriate site development plans, construction costs, and schedules.

During initial development, picnic areas and additional parking spaces should be provided at or near the proposed boat ramp on the Monticello subimpoundment. Initial development, as proposed by the Applicant, would provide only 10 parking spaces for cars with connected trailers, and no picnic facilities. Due to the small number of picnic facilities to be provided at Monticello and Parr reservoirs (10 picnic tables) and the proposed swimming beach to be provided adjacent to the boat ramp, picnicking and additional parking facilities should be constructed at the Monticello reservoir subimpoundment during initial development of outdoor recreation facilities.

All islands formed as a result of impounding Monticello reservoir should be reserved with their natural vegetation as wildlife refuge areas. Although the South Carolina Pollution Control Authority has classified the waters of Monticello Reservoir as a waste heat impoundment (letter of June 6, 1972),

noncontact water recreation such as canoeing or rowing (nonpowered boating only) may be allowed in the future. This would permit picnicking and primitive camping on the approximately 50 acres of islands that would be available for this use. Picnicking and primitive camping on the islands would not interfere with project operations. Sanitary facilities and a waste collection program would become necessary.

The Applicant's plan provides for initial recreational development in several areas and reserves other areas for future recreational needs. The Licensee should consult with appropriate Federal and State agencies periodically to determine future area recreational needs and should report these needs to the FPC in its biennial Form 80 filing. Licensee should file all plans developed from such consultation with the Commission for approval as amendments to the Exhibit R.

The Broad River is presently a turbid and somewhat polluted stream which the South Carolina Pollution Control Authority has rated "Class B" waters. The Broad River and Parr reservoir presently have little recreational appeal except for fishermen and hunters. The U.S. Department of the Interior cites a hunting visitor-day use of 187,000 on the Enoree Ranger District of the Sumter National Forest in 1970. (The existing Parr project is partly within the forest.) Waterfowl-hunting visitor-day use was 1,300 for 1970, and this is expected to exceed 10,000 in 1975. It should be noted,

however, that Parr is a very small part of the Enoree District. The enlargement of Parr reservoir would inundate 300 acres of national forest lands, including the entire Dawkins Waterfowl Management Area presently being developed to meet the increasing public demand for waterfowl hunting and viewing.

The Applicant has proposed approximately 1,110 acres of project land for recreational development. Two of the areas that would be reserved for future recreational use border on Parr reservoir. A 187-acre section is located on the reservoir at the mouth of Hellers Creek between County Road 28 and Parr reservoir (Figure 1-1). A boat landing area on Hellers Creek is one of the three initial recreational developments planned. A second recreational area of 387 acres is proposed for the north side of the mouth of Frees Creek between Parr and Monticello reservoirs.

Recreational use of these areas would be greatly limited by the reduced surface area caused by the 10-foot daily fluctuation that would occur on Parr reservoir. The average width of the mudflats on Parr reservoir would be approximately 375 feet, with range of about 25 to 1,000 feet. At low water, primarily in the evenings and night, numerous snags and extensive mudflats would be exposed in Hellers and Cahnon Creeks. Under these conditions, boating would be severely limited and the scenic values of the area would be degraded.

Frees Creek would form the tailrace for the Fairfield Pumped Storage Project, and therefore the proposed adjacent recreation area would not only have mudflats but would be adjacent to the high water velocities that would occur in Frees Creek below the powerhouse. Furthermore, the terrain is steep and dissected by drainage channels. The Southern Railway tracks cross the western edge of the area. These factors greatly limit the area's recreational potential.

As a mitigative measure to offset loss of waterfowl habitat and the associated hunting and viewing recreation, the possibility has been studied of creating a 165-acre subimpoundment containing storage of 1,204 acre-feet on the Hellers Creek arm of Parr reservoir (utilizing the entire acreage upstream of the Route 28 causeway). This would cause a loss of storage capacity of 1,085 acre-feet from the total usable storage capacity of Parr reservoir (29,000 acre-feet). Such loss of storage capacity could have a significant adverse effect on the power value of the project.

As an alternative to a Hellers Creek subimpoundment, public recreation needs and waterfowl habitat conservation would be better served by: (1) Creating several small greentree ponds of a few acres each in tributaries leading into the Cannons and Hellers Creek arms of Parr reservoir; and (2) Possible reassignment of portions of the presently proposed 387 and 180-acre recreational areas located adjacent to Frees and Hellers Creeks, respectively, to provide access areas at the suggested greentree subimpoundments on Cannons and Hellers Creeks for fishing and waterfowl hunting and viewing.

Plans for recreational development filed as part of the application are satisfactory to the extent that they provide for: (1) The creation of a 300-acre subimpoundment on Monticello reservoir; (2) Development on Monticello subimpoundment to include a 2-acre boat launch area with a boat ramp, parking for 10 cars with trailers, a swimming area, and sanitary facilities; (3) Construction of a 30-acre scenic overlook area along the east shore of the main body of Monticello reservoir to include 10 picnic tables, two benches, a covered platform, walkways, potable water, and sanitary facilities; (4) Provisions for possible future boat launching facilities on the main body of the Monticello reservoir; (5) Development of a 2-acre boat launch area on Parr reservoir to include a boat ramp, parking for five cars with trailers, and sanitary facilities; (6) Provisions for possible primitive camping areas and wildlife preserves on the main bodies of Monticello and Parr reservoirs; and (7) The acquisition of approximately 1,200 acres of land for initial and future recreational development.

To supplement its plans for recreational development, Licensee should, within one year following the issuance of any license for the proposed project, be required to file for Commission approval the following:

(1) Appropriate site development plans, construction costs, and development schedules for the visitors center and construction observation point, as proposed in the July 1972 amendment to the application for license; and

(2) Plans for additional recreational development at the proposed Monticello subimpoundment boat launch area, such as provisions for drinking water, picnicking, and additional parking facilities should they be needed.

Furthermore, within one year following commercial operation, the Licensee should file the results of a study showing the feasibility of constructing small greentree reservoirs at suitable locations on Cannons and Hellers Creeks, including costs of development; the effects, if any, and the magnitude of those effects on project operation; and plans for the development of such greentree reservoirs.

Licensee should construct, maintain, and operate or should arrange for the construction, maintenance, and operation of recreational facilities, including such modifications of access roads, trails, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities as may be prescribed by the Commission to utilize the natural resources and recreational values of the project area without impairment to its wilderness character.

The Licensee should consult and cooperate with Federal, regional, State, and local agencies in determining any additional need for recreational development at Project 1894.

The Licensee, when consistent with proper operation of the project and public safety, should allow the public free access to project waters and adjacent project lands for the purpose of optimum public utilization of such lands and waters for recreational purposes, including hunting and fishing.

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#### 10.3 PUBLIC SAFETY

The Company should retain a board of independent consultants to review the proposed design of the project and to periodically review its construction in order to assure a completely safe project.

Licensee should require its employees, contractors, and employees of contractors to prevent, to make advanced preparation for suppression of, and to suppress fires on lands occupied under the license.

Location and standards of roads, trails, quarries, borrow pits, spoil disposal areas, and sanitary facilities should be subject to the approval of any department or agency of the United States having supervision over the lands involved.

Licensee should place and maintain suitable structures and devices to reduce the possibility of contact between its telegraph and telephone transmission lines and other signal or power lines owned by itself or other organizations. Licensee should take necessary measures to minimize the possibility of any structures and wires falling and obstructing traffic and endangering life on project lands and waters.

Construction, operation, and maintenance of sanitary facilities, including septic tanks, sewage treatment plants, and solid waste land fills located in the project area, should comply with standards and regulations of the Federal, State, and local environmental agencies.

The Licensee should develop and implement a waste management plan for the project in cooperation with the appropriate Federal, State, and local agencies. 10.4 PROJECT VEGETATION AND SCENIC VALUES

In addition to the proposals in the July 1972 Exhibit V (Appendix C), the Licensee should:

(1) Conduct a study to determine plant species (trees and grasses) that would be suited to the project area and the fluctuation zones of the Monticello reservoir shoreline, and that could function as wildlife food and cover. This study should be conducted in cooperation with appropriate State agencies, following issuance of any license by the Commission, and should be completed and the results filed with the Commission prior to the beginning of operations of the pumped storage project.

(2) Establish test plots of plants found to be feasible in the above mentioned study in the reservoir fluctuation zone, following the startup of pumped storage operations, and study these plots over a period of two years to determine the survival capabilities and values of the vegetation for wildlife habitat and for scenic improvements. The results of such an experiment should be filed with the Commission following its completion.

(3) File planting plans for Commission approval within one year after completion of the experimental studies outlined in
(1) and (2) above.

10.5 WATERFOWL AND FISH HABITAT

Approximately 2,550 acres of bottom land hardwoods would

be flooded by raising the height of the existing Parr Dam. This additional surface acreage would not provide suitable wildlife habitat, especially for water fowl, due to the 10-foot daily fluctuation of Parr reservoir. As mitigation for this loss, the Applicant and the South Carolina Wildlife and Marine Resources Department have agreed upon a 90-acre greentree reservoir. About 300 acres of U.S. Forest Service land proposed for waterfowl management will be flooded by the enlarged Parr Reservoir. The Applicant has cooperated with the U. S. Forest Service to develop a mitigation plan for this potential loss (Appendix G). While these agreements could cover provisions to mitigate loss of some waterfowl habitat, it would not provide for mitigating the loss of habitat for other wildlife or the effect of fluctuation on fish habitat and fisheries in Parr reservoir. Even though the present Parr reservoir offers limited sport fishing, the future development of a potential fishery should not be overlooked.

Following issuance of any license for construction of the project, Licensee, in cooperation with South Carolina Wildlife and Marine Resources Department and the U.S. Bureau of Sport Fisheries and Wildlife, should be required to conduct a study to determine the sport fishing potential in Parr reservoir. Modification of project operation during the spawning periods of nest builders in Parr reservoir should be given consideration in such a study.

10.6 WATER QUALITY

Changes in water quality will occur as a result of construction and operation of the combined generating facilities

(hydro and nuclear). The extent of these changes and the resultant effect, if any, on the aquatic biota can be best determined by pre- and post-construction studies. The Applicant has proposed a preoperational and an operational water quality monitoring program as described in Section 4. The Applicant's program should adequately assess any changes in water quality due to operation of the project. Also, a monitoring station should be established by the Applicant in the Broad River downstream of Parr dam to measure dissolved oxygen, temperature, stream flow, conductivity, pH, and heavy metal concentrations. Dissolved oxygen, temperature, flow, conductivity, and pH should be monitored on a continuous basis. Turbidity and heavy metal determinations should be done with monthly grab samples. This would permit comparison with data collected at similar stations to be established above Parr dam. To assist personnel of the Columbia, South Carolina, water treatment plant in early detection of musty odors in the Broad River, the Licensee should include odor samples in its water quality monitoring program.

In order that the quality of the aquatic environment of the 300-acre subimpoundment may be known and can be maintained so that its potential recreational use is realized, the Applicant should conduct water quality analyses at selected locations. Sampling should be conducted on a monthly basis and should include those parameters listed in Table 4-2.

10-7 DOWNSTREAM FLOW RELEASES

Water releases from Parr reservoir into the Broad River

are needed to protect striped bass spawning in the Congaree River below the confluence of the Broad and Saluda Rivers. Striped bass spawning occurs in the upper reaches of the Congaree during March, April, and May. Adequate flow is necessary to insure successful spawning and hatching of striped bass eggs before they reach the Santee-Cooper reservoir. The Applicant and the South Carolina Wildlife and Marine Resources Department reached an agreement (Appendix A) on the rate of water release from Parr reservoir during the striped bass spawning period. The minimum release during this period is proposed to be 1,000 cfs and the daily average release would be the natural inflow of the Broad River into Parr reservoir. During the other months of the year, the minimum release would be 150 cfs, with a minimum daily average of 800 cfs. Any license issued should contain such provisions as well as provide for modifications of these flow regimes, should they prove inadequate in the future to protect the downstream aquatic habitat.

10.8 NUCLEAR STATION COOLING CAPACITY

The Applicant requested authorization from the Federal Power Commission to use Monticello reservoir for nuclear plant cooling purposes. The proposal is for use of project water for once-through cooling for the Virgil C. Summer nuclear complex. A future 900-mw nuclear station, to be built at a nearby location, utilizing cooling towers conjointly with the waters of Monticello reservoir is under consideration by the Applicant.

The Atomic Energy Commission has issued a construction permit for the 900-mw Unit I of the Summer plant. The Applicant will apply for permission to construct Unit II sometime after the first unit has gone on line, as the need arises for increased baseload generating capacity.

Although Applicant has requested permission for cooling waters for only one 900-mw unit, both Units I and II at the Virgil C. Summer plant site have been considered in environmental studies. Any license issued by the Federal Power Commission should include authorization for the use of the waters of the Monticello reservoir for cooling both 900-mw units of the Virgil C. Summer nuclear complex. However, the South Carolina Pollution Control Authority issued the water quality certificate (Appendix A), pursuant to Section 401 of the Federal Water Pollution Control Act Amendments of 1972, authorizing use of Monticello reservoir water for cooling only one 900-mw unit of the proposed Virgil C. Summer plant. Therefore, approval of Monticello reservoir for use as a heatsink for two 900-mw units should be dependent upon Applicant's filing with the Commission a valid water quality certificate from the State of South Carolina, authorizing the discharge of heated waters from a second 900-mw unit into Monticello reservoir prior to construction of such a unit.

The Applicant should file an application with the FPC for amendment to any license issued by the Commission for the presently proposed Project No. 1894, seeking authorization for any proposed joint use of project waters for cooling purposes for a future thermal plant beyond the two units of the Virgil C. Summer Nuclear Station.

10.9 ARCHEOLOGY

Should construction or operation of the project during the term of a license uncover any presently unknown archaeological sites, the Licensee should be required to consult with appropriate agencies to determine the need for and to pay the costs of archaeological survey and salvage work at the project prior to inundation.

10.10 TAKEOVER

No Federal department or agency has recommended that the United States exercise its right to take over the present project pursuant to Section 14 of the Federal Power Act.

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R-1

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- 57/ Atomic Energy Commission, Hearing. Jan. 1973. Tr. 298.
- 58/ South Carolina Electric and Gas, Environmental Report, Project No. 1894. July 26, 1972, pp. 2.2.5-40.
59/ Dames and Moore, <u>Draft Report on the Baseline Biotic</u> Survey, <u>Broad River Study Area</u>, <u>Parr, South Carolina</u> <u>March 1971 to May 1973</u>, for SCERG, Project No. 5182-046-17.

60/ See 48.

61/ Environmental Protection Agency, Surveillance and Analysis Division. Athens, Georgia. 1973. <u>The</u> <u>Relationship Between Substrate Content</u>, <u>Water</u> <u>Quality Actinomycotes</u>, and <u>Musty Odors in the</u> <u>Broad River Basin</u>. 76 pages.

# Appendix A

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DEPARTMENT OF THE ARMY. CHARLESTON DISTRICT, CORPS OF ENGINEERS P. O. BOX 919 CHARLESTCH, S.C. 29402

SANVK

19 August 1971

South Carolina Electric & Gas Company ATTN: Mr. W. E. Moore P. O. Ecx 764 Columbia, S. C. 29202

Dear Mr. Moore:

I write in response to your letter dated 13 August 1971 requesting information on Department of the Army permits for your proposed Parr Hydroelectric Project 1894. The maps included with the subject letter have been reviewed and since the Broad River above Columbia, S. C. is not presently considered by the Corps to be a navigable water, Section 10 permits (required for work in navigable waters) will not be required for any of the work as depicted. However, since the proposed project will create a thermal discharge into the Broad River, a tributary of a navigable water, a permit authorizing this discharge will be required by my office. This type of permit is required by Section 13 of the River and Harbor Act of 1899. Included herewith is a package of documents pertinent to the discharge permit system. This package includes the necessary application forms together with instructions on how to complete it.

I trust that the above supplies the information requested but, if I may be of further assistance, please do not hesitate to call.

Sincerel gina. fin ØHARLES E. EASTEURN

Incl

LTC, Corps of Engineers Acting District Engineer

# South Carolina Jollution Control Anthority



HUBERT J. WEEB, PH.D. EXECUTIVE DIRECTOR OWEN BUILDING 1321 LADY STREET P. O. BOX 11528 Columbia, South Carolinz 29211

January 11, 1973

## AUTHORITY MEMBERS

E. KENNETH AYCOCK, M.C.	•	•	COLUMPIA.
JAMES W. WEDB	•	•	GOLUNSIA
CLAIR P. GUESS, JR	•	•	COLUMBIA
BOB HIGKNAN	•	•	COLUMBIA
JOHN W. PARRIS	•	•	COLUMBIA
J. BONNER MANLY	•	•	COLUMIIA

AREA CODE 803 TELEPHONE: 758-2915

South Carolina Electric and Gas Company P. O. Box 764 Columbia, South Carolina 29202

Attention: Mr. E. H. Grews, Jr.

. CAMDEN

Re: Water Quality Certificate Monticello Impoundment and Fairfield Pumped Storage Facility Condition: Nuclear Unit # 1 only in operation

Dear Sir:

AUTHORITY MEMBERS DERT W. TURNER . . . CHARLESTON N.N. MILLER, M.D. . . . . . COLUMBIA HN MCCRADY, JR. . . . CHARLESTON CK E. POWERS . . . . SIMPSONVILLE LLIAM M. BRICE, JR. . . . . . . YORK

HN F. ANDREWS. PH D. . . . CLEMSON

MARION SHIVER, JR.

The South Carolina Pollution Control Authority has reviewed technical information submitted relative to the referenced facilities. Based on this review the Pollution Control Authority certifies that there is reasonable assurance that the construction and operation of the impoundment and pump storage facilities will not violate applicable water quality standards as regards operation of nuclear generation unit # 1.

As of this date there is no applicable effluent limit or other limitation under Section 301 (b) and 302 nor is there an applicable standard under Sections 306 and 307 of the Federal Water Pollution Control Act (PL92-500) dated October 18, 1972.

Sincerely yours,

R. Kunt

R. Kenneth Tinsley, Chief Water Pollution Control Division

RKT/CRJ:as

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JOHN F. ANDREWS, PH.D. . . CLENSON

. CANDEN

ARION SHIVER, JR.

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# South Carolina Inflution Control An. In

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HUBERT J. WEBB. PH.D. EXECUTIVE DIRECTOR OWEN BUILDING 1321 LADY STREET P. O. BOX I Columbia, Souily Carolina Z. February 13, 197:

•••	
AUTHORITY MEMBERS	
E. KENNETH AYCOCK, M.D	COLUMBIA
JAMES W. WEED	COLUMBIA
CLAIR P. GUESS, JR.	COLVYNIA
BOB HICKMAN	COLUMBIA
JOHN W. PARRIS	COLUMBIA
J. BONNER MANLY	Социмвна

AREA CODE 803 TELEPHONE: 755-2915

Mr. E. H. Crews, Jr. South Carolina Electric and Gas Company P. O. Box 764 Columbia, South Carolina 29202

> Proposed Dredging of a tailrace canal along Frees Creek from the proposed Fairfield Pump Storage Facility to the Broad River Fairfield County.

Dear Mr. Crews:

This is to certify that there is reasonable assurance that the proposed dredging work will be carried out in a manner which will not violate the applicable water quality standards. You may use this letter as the approval of the South Carolina Pollution Control Authority to perform the referenced work.

Yours truly,

Re:

#### SIGNED

R. Kenneth Tinsley, Chief Water Pollution Control Division

. . . . . . . . .

RKT.RC:as

# ENVIRONMENTAL PROTECTION AGENCY

1421 Peachtree St., N.E., Atlanta, Georgia 30309

January 18, 1973

Dr. Hubert J. Webb, Executive Secretary South Carolina Pollution Control Authority Owen Building, 1321 Lady Street P. O. Box 11628 Columbia, South Carolina 29201

DO NOT REMOVE

Dear Dr. Webb:

Section 303(a)(1) of the Federal Water Pollution Control Act, as amended, on October 18, 1972 requires that interstate water quality standards adopted by any state and submitted to, and approved by, or awaiting approval by the Administrator, shall remain in effect unless the Administrator determines that such standards are not consistent with the Act as in effect immediately prior to the date of the 1972 amendments. Further, it requires that each state be notified of any required changes no later than January 18, 1973.

The Act states in Section 101 that it is the national goal that, wherever attainable, an interim goal of water cuality that provides for the protection and propagation of Fish, Shellfish, and Wildlife and provides for Recreation in and on the waters be achieved by July 1, 1983.

The Environmental Protection Agency policy to carry out the intent of the 1972 amendments requires that all streams be classified as a minimum for Fish and Wildhife protection and propagation and secondary contact recreation. This policy is consistent with the stated goal in Section 101 of the 1972 amendments and, further, only these uses with their associated water quality criteria adequately protect public health and welfare and enhance water quality as required by Section 10(c)(3) of the previous Act. The complete policy is attached for your information.

A review of the South Carolina Standards including the stream use classifications approved by this office on January 15, 1973 indicates that these standards are in compliance with the requirements of the Act. JAN 25 的的

S. C. POLLUTION CONTROL AUTHORITY No further action is required at this time. We urge you to continue your current efforts to implement these Water Quality Standards at the earliest date possible.

We look forward to continuing our cooperative relationship with the South Carolina Pollution Control Authority.

Attachment

Sincerely yours,

Ravan Regional Administrator

A-7

MEMORANDUM OF UNDERSTANDING BETWEEN SOUTH CAROLINA WILDLIFE AND MARINE RESOURCES DEPARTMENT AND SCE&G CONCERNING PARE HYDRO-ELECTRIC PROJECT - FPC PROJECT - FPC PROJECT NO. 1894.

#### I. PREAMBLE

South Carolina Electric & Gas Company (hereinafter referred to as SCE&G) has filed with the U.S. Federal Power Commission an application for a new license for the Parr Hydroelectric Project - FPC Project No. 1894.

Maintaining that the statements appearing therein indicating a desire of SCE&G to cooperate with the S. C. Wildlife and Marine Resources Department (hereinafter referred to as Department) for minimizing environmental impact are sincere; SCE&G proposes the following statements of understanding between SCE&G and the Department to strengthen areas of the project's environmental program dealing with two specific practices that include the following:

> (1) Further assurance of a continual flow of water downstream from Parr Powerhouse necessary for the survival, reproduction and normal life cycle activities of all species of fish with particular regard to the striped bass spawn during the months of March, April and May.

(2) Plans of the Land Management Program to offset the disturbance as a result of the project on the terrestrial ecological system that will include planting appropriate ground cover for wildlife food source and dedicating approximately 90 acres of suitable lands adjacent to the Reservoirs to the Department for a green tree reservoir site.

II. WATER FLOW FROM PARR POWERHOUSE SCE&G agrees to supply the necessary needed instantaneous and daily minimum flow of water from Parr Powerhouse as follows:

Α.

During all months of the year except March, April and May, and so long as the minimum daily average inflow of the Broad River into Parr Reservoir is not less than the following indicated minimum daily flow, the water release from the Parr Powerhouse less evaporation loss of the Parr and Monticello pools will be 150 CFS instantaneous and 800 CFS minimum daily average. During the months of March, April and May and so long as the daily average inflow of the Broad River into Parr Reservoir is not less than the following indicated minimum instantaneous daily flow, the water release from the Parr Powerhouse less evaporation loss of the Parr and Monticello pools will be l000 CFS instantaneous and the daily average release will be the natural inflow of Broad River into Parr Reservoir. The maximum anticipated increase loss of water due to evaporation losses will be approximately <u>88</u> CFS and will occur during the months of <u>July</u> and <u>August</u> of a calendar year.

SCE&G agrees that for the duration of its FPC License that the Department shall have access to all water monitoring stations maintained in connection with the project; SCE&G gives further assurance that such stations shall be maintained for the duration of the License.

в.

In order to clarify the Land Management Program in those areas of specific interest to the Department, SCE&G will provide the following:

> A. General Practice for Management of Timber and Lands of

#### Parr Hydroelectric Project

Due to the changing of the water level, there will be scattered tree mortality around the reservoir. Associated with these dead and weakened trees exists the potential for a high forest insect buildup. To reduce this threat to the woodlands surrounding the reservoir a small crew will patrol the area, remove, burn or spray with <u>B.H.C.</u> dead or dying trees for a period of two years following the raising of the water level, if desirable and recommended by the Department, PCA or other state agency.

After clearing the area around the reservoir, some floating debris will exist. SCE&G will remove this floating debris as required. Other than in areas designated for recreation or necessary to the construction of the reservoir no cutting will be allowed except for dead or dying trees. During construction steep banks and areas subject to erosion are to be secured. The method of preventing this erosion will vary with slope and accessibility. Methods employed will be water bars, planting, riprap, etc.

Temporary roads and construction areas when no longer in use will be disced, fertilized and planted, including the following designated areas of right-of-way. Planting will be in accordance with the general specifications described in part IV of this Memorandum of Understanding.

B. <u>Special Areas for Green Tree Reservoir</u> Upon completion of the site topographic survey, SCE&G will dedicate approximately 90 acres of suitable Broad River bottom land to the Department for development as a green tree reservoir site.

C. Construction Areas Planned for Planting

The maps of the areas involving construction are not completed, however, the area to be planted will not be less than 50 acres. The 50 acres will include the surface area of dams, temporary construction roads, temporary construction lay down areas, temporary parking areas, and spoil areas.

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D. Areas of Transmission Line Right-

of-Way Areas Follows:

Right-of-Way Areas:

Fairfield Summer 230 KV line.

From N-470,500; E-1,899,750 to N-472,880; E-1, 902,100 plant type A (see IV). This area is approximately 3200' long X 170' wide or about 12 Acres.

Remainder of line to be left for natural growth or included in the plant landscape.

Total estimated planted area - 12 Acres. The relocated Duke Power Company Great Falls-Newberry 100 KV Double Circuit Line.

All areas between coordinates N-479,820; E-1, 899,580 to N-476,000; E-1,900,325 plant type A (see IV). This area is approximately 4000' long X 100' wide or about 8 Acres. All areas from N-476,000; E-1,900,325 to N-474, 500; E-1,900,930 are to be cleared as required and left for natural growth or included in plant landscape.

All areas from N-474,500; E-1,900,930 to N-472, 960; E-1,902,160 to be planted type A (see IV). This area is approximately 2000' long  $\overline{X}$  100' wide or about 5 Acres. From N-472,960; E-1,902,160 to N-470,730; E-1,906,270 to be cleared as required and left for natural growth or included in plant landscape.

All areas from N-470,730; E-1,906,270 to N-471,400; E-1,910,000. This area is approximately 3000' long X 100' wide or about 6 Acres (roadway not included). Total estimated planted area 19 Acres.

#### IV. GENERAL PLANTING SPECIFICATIONS

These specifications are to provide for establishment of ground cover for the purposes of erosion control and development of food sources for wildlife in the vicinity of FPC Project 1894 (Parr Hydroelectric Project). The areas, as previously described, will include transmission line rightof-way, construction areas no longer in use, temporary roads, lay down, temporary parking, dam faces and spoil areas. Planting techniques for all available areas will be either by procedure A or B as described in Section IV and will be accomplished during the spring season following completion of construction.

Current plans are that the contractors working for SCE&G are to provide all labor, equipment, supervision and if specified in the individual contract, all fertilizer and seed

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to fulfill all requirements of the Land Management Programs, however, SCE&G assumes complete responsibility to accomplish the work described.

Ground maintenance of planted areas shall be to bush hogging or otherwise cut undesirable growth as required (estimated at 2 to 3 year intervals). Fertilizing shall be carried out if required at this same time.

Type B planting will normally be used but type A will be used for small areas with slight slopes and where larger quantities and/or earlier production of food may be required.

Additional planting areas may be designated by SCE&G in cooperation with the U.S. Soil Conservation Service and after consultation with the Department.

Type A - Machine

In those areas designated by SCE&G, the A type preparation and planting will be carried out during the first planting season after construction is completed./

The area to be planted will be thoroughly worked up with a tush and hog harrow (or equal equipment) to a depth of about 2-4 inches. In the case of line rights-of-way, this shall be along the entire width of the right-of-way in the planting area except for roads or trails and within 2 to 5 feet of a drainage ditch. Soil preparation shall be dressed to parallel the natural existing contours.

Planting areas will not include permanent swamps, marshes or other consistently wet areas.

All areas of type "A" shall be fertilized evenly at the rate and with the type seeding specified. The appropriate seed shall be sown evenly over the entire prepared

Sowing shall be accomplished between April 1 and May 30 or at such other date that SCE&G and the Department shall deem more appropriate of the year following the completion of construction.

Water bars or other means shall also be employed to prevent erosion on slopes exceeding 2 degrees.

The seed or seeds used shall be as specified by the Department.

Type B - Helicopter

area.

In those areas designated by SCE&G, the "B" type of planting will be carried out during the first planting season after construction is completed. The area designated will be sown and fertilized in a simultaneous flyover with a low, slow flying helicopter. The planting area will not receive seed bed preparation as Type A. All slopes will be planted. Erosion control measures such as ditches, terraces, etc. will be completed at the time of initial area clearing or during line construction if the area is a right-of-way.

Planting areas will not include permanent swamps, marshes, or other consistently wet areas.

Sowing shall be accomplished between April 1 and May 30 or at such other time of the year immediately following completion of construction of the line. The appropriate seed and fertilizer mixture will be spread evenly over the entire width of the designated right-of-way.

The seed or seeds used shall be as specified by the Department.

Fertilizer for type A and B may be varied based on recommendations by the U.S. Department of Agriculture, Soil Conservation Services.

DATED this 15 day of Feb., 1973, at

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Columbia, South Carolina.



South Carolina Wildlife and Marine Resources Department

17 BY:

South Carolina Electric & Gas Company

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Summer, Senior Vice President c.

#### СОРҮ

#### UNITED STATES A-19

ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20243

#### SOUTH CAROLINA ELECTRIC AND GAS COMPANY

(Virgil C. Summer Nuclear Station, Unit 1)

#### DOCKET NO. 50-395

#### CONSTRUCTION PERMIT

Construction Permit No. CPPR-94

- 1. Pursuant to Section 103 of the Atomic Energy Act of 1954, as amended (the Act), and Title 10, Chapter 1, Code of Federal Regulations, Part 50, "Licensing of Production and Utilization Facilities," and pursuant to the Initial Decision of the Atomic Safety and Licensing Board, the Atomic Energy Commission (the Commission) hereby issues a construction permit to the South Carolina Electric and Gas Company (the applicant) for a utilization facility (the facility), designed to operate at 2775 megawatts thermal with a net electrical output of approximately 900 megawatts as described in the application and amendments thereto, (the application), filed in this matter by the applicant and as more fully described in the evidence received at the public hearing upon that application. The facility, known as the Virgil C. Summer Nuclear Station, Unit 1, will be located at the applicant's site in Fairfield County, South Carolina. The site is located immediately north of Parr, South Carolina, and is adjacent to the Monticello Reservoir created by placing a series of dams across Frees Creek, a tributary of the Broad River. The Reservoir is located east of the Broad River and west of South Carolina State Highway 215, about 26 miles north of Columbia, in western Fairfield County, South Carolina.
- 2. This permit shall be deemed to contain and be subject to the conditions specified in Sections 50.54 and 50.55 of said regulations; is subject to all applicable provisions of the Act, and rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the conditions specified or incorporated below:

<u>COPY</u>

- A. The earliest date for the completion of the facility is January 1, 1977, and the latest date for completion of the facility is January 1, 1978.
- B. The facility shall be constructed and located at the
  site as described in the application, in Fairfield County, South Carolina.
- C. This construction permit authorized the applicant to construct the facility described in the application, and the hearing record in accordance with the principal architectural and engineering criteria sit forth therein.
- D. In view of the fact that the Attorney General has not recommended an antitrust hearing in this matter, that no antitrust issues have been raised by another in a manner according with the Commission's Rules of Practice, and that no finding has been made that an antitrust hearing is otherwise required (10 CFR, Part 2, §2.104(d)), antitrust review of the application for this construction permit under Section 105c of the Atomic Energy Act of 1954, as amended, has been completed and a hearing thereon determined to be unnecessary.
- E. This construction permit is subject to the following conditions for the protection of the environment:
  - The applicant will perform preoperational measurements of the physical, chemical and biological parameters of the environment to establish baseline conditions upon which possible adverse effects of the station can be evaluated.
  - 2. The applicant will submit to the regulatory staff (staff) a proposed plan for an operational environmental monitoring program. Staff approval of this plan will be obtained prior to the granting of an operating license.
  - 3. The applicant shall select, design and construct the transmission lines in accordance with appropriate Federal guidelines.

4. The applicant shall use appropriate federal and state guidelines and regulations in matters concerning sanitation in recreational areas to be constructed as part of this project.

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- 5. The applicant shall establish a radiation monitoring system to determine the radioiodine concentration at the site boundary, to insure that the 5 mrem/yr dosage to the 2-gram thyroid organ of a child through the pasture-cow-milk pathway will not be exceeded.
- 6. The applicant shall file an amendment to its application for the Virgil C. Summer Station requesting approval of an alternate method of cooling the reactor if the Monticello Reservoir is not created; such amendment shall include complete details of the environmental impact of the alternate cooling method, and details of feasible alternatives thereto.
- The permit is subject to the limitation that a license 3. authorizing operation of the facility will not be issued by the Commission unless (a) the applicant submits to the Commission, by filing an application for an operating license or by amendment to the application for a license to construct and operate the facility, a complete final safety analysis report, portions of which may be submitted and evaluated from time to time; (b) the Commission finds that the final design provides reasonable assurance that the health and safety of the public will not be endangered by the operation of the facility in accordance with procedures approved by it in connection with the issuance of said license; and (c) the applicant submits proof of financial protection and the execution of an indemnity agreement as required by Section 170 of the Act.

FOR THE ATOMIC ENERGY COMMISSION

A. Giambusso, Deputy Director for Reactor Projects Directorate of Licensing

/s/·

Date of Issuance: MAR 21 1973

<u>COPY</u>



A-22 South Carolina Department of Archives and History 1430 Senate Street Columbia, S.C.

> P. O. Box 11,188 Capitol Station 29211

June 1, 1972

Mr. W. E. Moore Senior Engineer South Carolina Electric & Gas Co. P.O. Box 764 Columbia, South Carolina 29218

Dear Mr. Moore:

This letter is in reference to the South Carolina Electric & Gas Company's proposed Parr Hydroelectric Project (No. 1894) in Fairfield County.

The site of the nuclear station and the proposed area to be included in the man-made lakes has been checked with the South Carolina Department of Archives and History and the Fairfield County Historical Commission. We have determined that no adverse effects to historic properties in the area will result from the project as explained to us in the fall of 1971.

The only historically or architecturally important places recorded by us from this area are the Davis Plantation (on the National Register), Fonti Flora, and Monticello Church. We have been assured by SCE&G that none of these will be affected. The only historic areas of importance which will be adversely affected by the nuclear project are three cemeteries and SCE&G has agreed to move these.

The SCE&G Company has been extremely cooperative in assuring that no historic properties will be harmed by the proposed nuclear project.

Sincerely,

(Think 7. Jant

Charles E. Lee  $t^{n}$ State Liaison Officer for Historic Preservation

CEL/pn



South Carolina Department of Archives and History 1430 Senate Street Columbia, S.C.

> P. O. Box 11,188 Capitol Station 29211 October 20, 1972 POWER COMMISS DOCKETED OCT 24 1972

Mr. Kenneth F. Plumb Secretary Federal Power Commission Washington, D. C. 20426

Dear Mr. Plumb:

In reference to the new license for South Carolina Electric and Gas Company's Project No. 1894 including a proposal to construct a pumped storage development, we have determined that no adverse effects to historic properties will result from the project.

As we indicated in earlier correspondence pertaining to environmental impact of Project No. 1894, the only historically important places recorded by us in this area are the Davis Plantation (which is on the National Register of Historic Places) and two properties which are listed on our statewide survey of historic places: Fonti Flora and Monticello Church.

As South Carolina's State Liaison Officer for Historic Preservation, I appreciate the exceptionally fine cooperation of the South Carolina Electric and Gas Company in protecting the environmental quality of the project area insofar as historical aspects are concerned. Not only has SCE&G been diligent in supplying our Historic Preservation Division with the necessary statistics and map data, but the company has also been cooperative and generous in relocating and marking five small cemeteries in the area. In fact, we like to point to this particular project as a good example of coordinated planning with industry to protect environmental quality.

Since

Charles E. Lee State Liaison Officer for Historic Preservation

CEL:czf

CC: Environmental Protection Agency Mr. E. L. Pressley--SCE&G Mr. Robert Garvey--Advisory Council on Historic Preservation Mr. George Knighton--United States Atomic Energy Lommission

Appendix B

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# CHECKLIST OF FLORA AND FAUNA OCCURING IN THE AREA OF THE PARR HYDROELECTRIC PROJECTS -- FAIRFIELD AND NEWBERRY COUNTIES, SOUTH CAROLINA

	TREES		
Common Name		Scientific Name	
Red Maple	• · · ·	Acer rubrum	
Silver Maple		Acer saccharinum	
River Birch	· .	Betula nigra	
Bitternut Hickory		Carya cordiformis	
Mockernut Hickory		Carya tomentosa	
Pignut Hickory	· · · · · ·	Carya glabra	
Shagbark Hickory	· · · · · · ·	Carya ovata	
Georgia Hackberry	· · · · · · · · · · · · · · · · · · ·	<u>Celtis</u> <u>tenuifolia</u>	
Sugarberry		<u>Celtis</u> laevigata	
Flowering Dogwood	· · · · ·	Cornus florida	
Pagoda Dogwood	· · ·	Cornus alternifolia	
Common Persimmon		Diospyros virginia	
American Beech		Fagus grandifolia	
White Ash		Fraxinus americana	
Green Ash	•	Fraxinus pennsylvanica	
American Holly		Ilex opaca	
Black Walnut	•	Juglans nigra	
Butternut		Juglans cinerea	
Eastern Redcedar	÷	Juniperus virginiana	
Sweetgum		Liguidambar styraciflus	
Yellow Poplar		Liriodendron tulipifera	
Cucumbertree	· · · ·	Magnolia accuminata	
Black Tupelo	•	Nyssa sylvatica	

Common Name
Eastern Hophornbeau
Loblolly Pine
Shortleaf Pine
Virginia Pine
American Sycamore
Eastern Cottonwood
White Poplar
Black Cherry
Black Oak
Chestnut Oak
Chinkapin Oak
Blackjack Oak
Red Oak
Post Oak
Scarlet Oak
Southern Red Oak
Water Oak
White Oak
Willow Oak
Overcup Oak
Black Willow
Sassafras
White Basswood
American Elm
Slippery Elm

Scientific Name Ostrya virginiana Pinus taeda Pinus echinata Pinus virginiana Platanus occidentalis Populus deltoides Populus alba Prunus serotina Quercus velutina Quercus prinus Quercus muchlenbergii Quercus marilandica Quercus rubra Quercus stellata Quercus coccinea Quercus falcata Quercus nigra Quercus alba Quercus phellos Quercus lyrata Salix nigra Sassafras albidum Tilia heterophylla Ulmus americana Ulmus rubra

B-4

Common Name Winged Elm Red Mulberry Ironwood Pear Mimosa Honey Locust Tree of Heaven China-Berry Hercules Club Sourwood Pawpaw Witch Hazel Scientific Name Ulmus alata Morus rubra Carpinus caroliniana Pyrus communis Albizia julibrissin Gleditsia triacanthos Ailanthus altissima Melia azedarach Aralia spinosa Oxydendrum arboreum Asimina triloba Hamamelis virginiana

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WOODY SHRU	BS & VINES
Common Name	Scientific Name
Hazel-Nut	Corvlus americana
Tag	Alnus serrulata
Sweet-Shrub	Calycanthus floridus
Mock Orange	Philadelphus inodorus
Briar	Rubus sp.
Macartney Rose	Rosa bracteata
Wild Rose	Rosa carolina
Hawthorn	Crataegus sp.
Juneberry	Amelanchier canadensis
Chickasaw Plum	Prunus angustifolia
American Plum	Prunus pensvlvanica
Hog Plum	Prunus umbellata
Anphora	Amphora sp.
Clammy Locust	Robinia viscosa
Dwarf Sumac	Rhus copallina
Smooth Sumac	<u>Rhus glabra</u>
Possum Haw	Ilex decidua
Strawberry Bush	Euonymus americanus
New Jersey Tea	Ceanothus americanus
Buckthorn	Rhamnus caroliniana
Virginia Creeper	Parthenocissus cinquefolia
Muscadine -	Vitis rotundifolia
Possum Grape	<u>Vitis</u> baileyana
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Summer Grape Silverberry Leatherwood Swamp Dogwood Silky-Stem Dogwood Wild Azalea Pinxter-Flower Sparkleberry Gooseberry . Elliott's Blueberry Low Bush Blueberry Southern Buckthorn Storax Fringe-Tree Privet Yellow Jessamine Climbing Dogbane French Mulberry Cross Vine Trumpet Vine Button Bush Japanese Honeysuckle Coral Honeysuckle Blue Haw Southern Arrow-Wood Elderberry - Grondsel-Tree Fleabane Horseweed

Vitis aeștivalis Elaegnus umbellata Pirca palustris Cornus stricta Cornus amomum Rhododenron canescens Rhododendron atlanticum Vaccinium arboreum Vaccinium stamineum Vaccinium elliottii Vaccinium vacillans Bumelia lycioides Styrax grandifolia Chionanthus virginicus Ligustrum sinense Gelsemium sempervirens Trachelospermum difforme Callicarpa americana Anisostichus capreolata Campsis radicans Cephalanthus occidentalis Lonicera japonića Lonicera sempervirens Viburnum rufidulum Viburnum dentatum Sambucus canadensis Baccharis halimifolia Erîgeron sp. Erigeron candensis

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## FERNS AND MISCELLANEOUS PLANTS

Common Name Christman Fern Ebony-Stem Spleenwort Netted Chain-Fern Royal Fern Hairy Lip Fern Bracken Fern Resurrection Fern Common Cat-Tail Pondweed Water Plantain Duck Potato Scientific Name Polystichum acrostichoides Asplenium platyneuron Woodwardia areolata Osmunda regalis Cheilanthes lanosa Pteridium aquilinum Polypodium polypodioides Typha latifolia Potamogeton diversifolius Alisma subcordatum Sagittaria latifolia

GRASSES, SEDGES, AND RUSHES

Giant Reed Purpletop Wild Oats Love Grass Quaking Grass Cheat Grass Brome Grass Blue Grass Melic Grass Manna Grass Fescue <u>ND RUSHES</u> <u>Arundo donax</u> <u>Tridens flavus</u> <u>Uniola latifolia</u> <u>Eragrostis hirsuta</u> <u>Briza minor</u> <u>Bromus secalinus</u> <u>Bromus sp.</u> <u>Poa annua</u> <u>Melica mutica</u> <u>Glyceria striata</u> Festuca sp.

Lommon Name
Rye Grass
Wheat
Barley
Bottlebrush Grass
Wild Rye Grass
Wedge Grass
Oat Grașs
Hairgrass
Needle Grass
Dropseed
Bent Grass
Wood Reed
Crowfoot Grass
Goose Grass
Bermuda Grass
Beard Grass
Canary Grass
Foxtail Grass
Sandspurs
Barnyard Grass
Paspalum
Crab Grass
Carpet Grass
Panic Grass
Beard Grass
Broom-Straw

Scientific Name Lolium multiflorum Triticum aestivum Hordeum pusillum Hystrix patula Elymus virginicus Sphenopholis sp. Danthonia sp. <u>Aira sp</u>. Stipa avenacea Sporobolus clandestinus Agrostis sp. Cinna arundinacea Dactyloctenium aegyptium Eleusine indica Cynodon dactylon Gymnodogon ambiguous Phalaris caroliniana Setaria sp. Cenchrus incertus Echinochloa sp. Paspalum sp. Digitaria sanguinalis Axonopus sn. Panicum sp. Erianthus contortus Andropogen sp.

Common Name Gamma Grass Umbrella Sedge Spike-Rush Bulbostylis Fimbristylis Bulrush Umbrella Grass Beak Rush Sedge Rush

Day Flower Spiderwort Pickerelweed Asparagus Greenbriar Trillium False Solmon's Seal Solomon's Seal Bear Grass Blazing Star Grape Hyacinth Daylily Bellwort Wild Onion Wild Yam Scientific Name Tripsacum dactyloides Cyperus sp. Eleocharis obtusa Bulbostylis sp. Fimbristylis sp. Scirpus sp. Fuirena squarrosa Rhyncnospora sp. Carex sp. Juncus sp.

## HERBACEOUS PLANTS

Commelina sp. Trandescantia sp. Pontederia cordata Asparagus officinalis Similax sp. Trillium catesbaei Smilacina racemosa Polygonatum biflorum Yucca filamentosa Chamaelirium luteum Muscari racemosum Hemerocallis fulya Uvularia perfoliata Allium sp. Dioscorea villosa Common Name Atamasco Lily Agave Blackberry Lily Blue-Eyed Grass Yellow-Fringed Orchid Crane-Fly Orchid Lizard's Tail Wood-Nettle False Nettle Birthwort Wild Ginger Dock Knotweed Lamb's Quarters Pigweed Thorny Amaranthus Cottonweed Poke Carpet-Weed Talinum Scleranthus Stipulicida Chickweed Mouse-Ear Chickweek Pearl Wort

Scientific Name Zephryanthes\_atamasco Agave virginica Belamcanda chinensis Sisyrinchium sp. Habenaria cristata Tipularia discolor Saururus cernuus Laportea canadensis Boehmeria cylindrica Aristolochia serpentaria Hexastylis arifolia Rumex sp. Polygonum sp. Chenopodium album Amaranthus hybridus Amaranthus spinosus Froelichia floridana Phytolacca americana Mullugo verticillata Talinum teretifolium Scleranthus annus Stipulicida setacea Stellaria sp. Cerastium holosteoides Sagina decumbens

Common Name Sandwart Pink Corn-Cockle Soapwort Sleepy Cathfly Wild Pink Larkspur Leather-Flower Windflower Meadow Rue Mouse-Tail Buttercup Round-Lobed Liverleaf Anemone May-Apple Coralbeads Bloodroot Drapa Whitlow-Grass Poor-Man's Pepper Wart-Cress Shepherd's Purse Mouse-Ear Cross' Hedge Mustard Winter Cress Dittor Cress

Scientific Name Arenaria serpyllifolia Dianthus armeria Agrostemma githago Saponaria officinalis Silene antirrhia Silene caroliniana Delphinium ajacis Clematis viorna Thalictrum thalictroides Thalictrum revolutum Myosurus minimus Ranunculus sp. Hepatica americana Anemone lancifolia Podophyllum peltatum <u>Cocculus</u> carolinus Sanguinaria canadensis Drapa brachycarpa Drapa verna Lepidium virginicum Coronopus didymus Capsella bursa-pastoris Arabidopsis thaliana Sisymbrium officinale Barbarea verna Cardamine hirsuta

B-12

Common Name

Rock-Cress

Sibara

Stonecrop

Ditch Stonecrop

Alumroot

Foamflower

Strawberry

Cinquefoils

Geum

Cocklebur

Sicklepod

Wild Sensitive Plant

False Indigo

Rattleboxs

Clover

Sour Clover

Alfalfa

Black Medic

Spotted Medic

Lotus

Samson Snakeroot

Pencil Flower

Beggar's Ticks

Lespedezas

Glottidium

Wisteria

Scientific Name <u>Sibara virginica</u> Arabis canadensis Sedum pusillum Penthorum sedoides Heuchera americana Tiarella cordifolia Fragaria virginiana Potentilla sp. Geum sp. Agrimonia rostellata Cassia obtusifolia Cassia nictitans Baptisia sp. Crotalaria sp. Trifolium sp. Melilotus indica Medicago sativa Medicago lupulina Medicago arabica Lotus helleri Psoralea psoralioides Stylosanthes biflora Desmodium sp. Lespedeza sp. Glottidium vesicarium Wisteria sinensis

Common Name Goat's Rue Vetchs Vetchling Everlasting Pea Butterfly Pea Rhynchosia Wild Bean Kudzu Milk Pea Flax Wood Sorrel Wild Geranium Polygala Croton Hogwort Three-Seeded Mercury Tragia Flowering Spurges Spotted Touch-Me-Not Modiola Mallow Rose Mallow St. Andrew's Cross Pineweed Pin-Weed Violet

Scientific Name Tephrosia sp. Vicia sp. Lathryrus hirsutus Lathryrus latifolius (Centrosema virginianum Clitoria mariana Rhynchosia sp. Strophostyles umbellata Pueraria lobata Galactia sp. Linum virginianum Oxalis sp. Geranium sp. Polygala sp. Croton glandulosus Croton capitatus Acalypha sp. Tragia urticifolia Euphorbia sp. Impatiens capensis Modiola caroliniana Sida rhombifólia Hibiscus moscheutos Hypericum hypericoides Hypericum sp. Lechea sp. Viola sp.
Common Name Maypops Prickly Pear Meadow Beauty Ludwigia Evening Primose Parrot-Feather Marsh Pennywort Snakeroot Wild Carrot Wild Chervil Golden Alexander Zizia Meadow Parsnip -Marsh Parsley Spermolepis Lovage Water Hemlock Mock Bishop's-Weed Angelica Spotted Wintergreen Fringed Loosestrife Water Pimpernel Indian Pink Polypremum Rose Pink

Scientific Name Passiflora incarnata Opuntia compressa Rhexia mariana Ludwigia sp. Oenothera sp. Myriophyllum brasiliense Hydrocotyle sp. Sanicula sp. Daucus sp. Chaerophyllum tainturieri Taenidia integerrima <u>Zizia sp</u>. Thaspium barbinode Apium leptophyllum Spermolepis divaricata Ligusticum canadense Cicuta maculata Ptilimnium capillaceum Angelica venenosa Chimaphila maculata Lysimachia sp. Samolus parviflorus Spigelia marilandica Polypremum procumbens Sabtia angularis

Common Name Blue Star Indian Hemp Butterflyweed Milkweed Matelea Dodder Field Dodder Dichondra Morning Glory Man Root Phlox Heliotrope Viper's Blugloss Vervain Blue Curls American Germander Skullcap Heal-All Henbit Lyre-Leaved Sage Blue Sage Downy Wood Mint Mountain Mint Common Dittany Bugleweed

Scientific Name Amsonia tabernaemontana Apocynum canabinum Asclepias tuberosa Asclepias sp. Matelea sp. Cuscuta pentagona Cuscuta campestris Dichondra carolinensis Ipomoea sp. Ipomoea pandurata Phlox sp. Heliotropium amplexicaule Echium vulgare Verbena sp. Trichostema dichotomum Teucrium canadense Scutellaria sp. Prunella vulgaris Lamium amplexicaule Salvia lyrata Salvia azurea Blephilia ciliata Pycnanthemum tenuifolium Cunila origanoides (Lycopus virginicus (Lycopus rubellus

Common Name

Peppermint

Ground Cherry

Salpichroa

Horse-Nettle

Jimsonweed

Petunia

Hedge Hyssop

False Pimpernel

Monkey-Flower

Mullein

Toad-Flax

Veronica

Aureolaria

Gerardia

Ruellia

Plantain

Buttonweed.

Richardia

Partridge Berry

Bluets

Field Madder

Bedstraw

Corn Salad

Creeping Cucumber

Venus Looking Glass

Scientific Name Mentha piperita. Physalis sp. Salpichroa origanifolia Solanum carolinense Datura stramonium Petunia atkinsiana Gratiola virginiana Lindernia dubia Mimulus ringens Verbascum sp. Linaria canadensis Veronica arvensis Aureolaria virginica Agalinis sp. Ruellia sp. Plantago sp. Diodia sp. Richardia brasiliensis Mitchella repens Hudstonia sp. Sherardia arvensis Galium sp,/ Valerianella radiata Melothria pendula Specularia perfoliata

Common Name Cardinal Flower Lobelia Common Ragweed Cocklebur Gall-Of-The-Earth Prickly Lettuce Spiny-Leaved Sow Thistle Common Sow Thistle Rattlesnake-Weed Hawkweed Hawk's-Beard . Cat's Ear Dwarf Dandelion False Dandelion Pale Indian Plantain Butterweed Groundsel Fireweed Bachelor's Button Bull Thistle Yellow Thistle Thistle Ironweed Elephant's Foot Blazing Star

Scientific Name Lobelia cardinalis Lobelia sp. Ambrosia artemisifolia Xanthium strumarium Prenanthes serpentaria Lactuca sp. Sonchus asper Sonchus oleraceus Hieracium venosum Hieracium gronovii Crepis pulchra Hypochoeris sp. Krigia sp. Pyrrhopappus carolinianus Cacalia atriplicifolia Senecio glabellus Senecio smallii Erechites hieracifolia Centaurea cyanus Carduus lanceclatus Carduus spinopissimus Carduus repandus Veronia sp. Elephantopus sp. Liatris sp.

B-18.

Common Name Thoroughwort Joe-Pye Weed Thoroughworts Climbing Hempweed Marsh Fleabane Facelis -Pussy-Toes Rabbit Tobacco Catfoot Asters Goldenrod Camphorweed Green and Gold Wild Quinine Yerba-De-Tajo Coneflower Black-Eyed Susan Sunflower Jerusalem Artichoke Crown-Beard Calliopsis Beggar's Ticks Sneeze Weed Bitter Weed Yarrow Dog Fennel Ox-Eye Daisy

Scientific Name Eupatorium dubium Eupatorium fistulosum Eupatorium sp. Mikania scandens Pulchea camphorata Facelis retusa Antennaria plantaginifolia Gnaphalium obtusifolium Gnaphalium purpureum Aster sp. Solidago sp. Heterotheca sp. Chrysogonum virginianum Parthenium integrifolium <u>Eclipta alba</u> Rudbeckia fulgida Rudbeckia hirta Helianthus sp. Helianthus tuberosus Verbesina occidentalis Coreopsis tinctoria Bidens frondosa Helenium sp. Helenium amarum Achillea millefolium Anthemis sp. Chrysanthenum leucanthenum

## WATERFOWL

Common Loon Red-necked Grebe Least Grebe Mallard Black Duck Pintail Gadwall American Widgeon Shoveler Blue-winged Teal Green-winged Teal Wood Duck Redhead Canvasback Ring-necked Duck Greater Scaup Lesser Scaup Common Goldeneye Bufflehead Ruddy Duck

Common Name

Scientific Name Gavia immer Podiceps grisegena Podiceps dominicus Anas plalyrhinchos Anas rubripes Anas acuta Anas strepera Mareca americanus Spatula clypseata Anas discors Anas carolinensis Aix sponsa Aythya americana Aythya valisineria <u>Aythya</u> <u>collaris</u> Aythya morila Aythya affinis Bucephala changula Bucephala albeola Oxyura jamaicensis

# B-20

Red-breasted Merganser Hooded Merganser

Turkey Vulture Black Vulture Cooper's Hawk Sharp-shinned Hawk Maesh Hawk Red-tailed Hawk Red-shouldered Hawk Broad-winged Hawk Golden Eagle Bald Eagle Osprey Merlin Kestrel Bobwhite Screech Owl Great Horned Owl Longed-eared Owl Short-eared Owl Barn Owl Barred Owl

Lophodytes cucullatus Cathartes aura Coragyps atratus Accipiter cooperii Accipiter striatus Circus cyaneus Buteo jamaicensis Buteo lineatus Buteo platvpterus Aquila chrysaetos Haliaeetus leucocephalus Pandion haliaetus Falco columbarius Falco sparverius Colinus virginianus Ötus asio Bubo virginianus Asio otus Asio flammeus Tyto alba <u>Strix varia</u>

Mergus serrator

E-21

RAPTORS

Saw-whet Owl

B-22

SHORE BIRDS

Common Egret

Cattle Egret

Great Blue Heron Green Heron

Black-capped Night Heron

American Bittern

Least Bittern

Sora Yellow Rail Black Rail King Rail Common Gallinule American Coot Turkey Black-bellied Plover Semipalmated Plover Kildeer Upland Plover Solitary Sandpiper

Spotted Sandpiper

Aegolis acadicus Casmerodius albus Bubulcus ibis Ardea herodias Butorides virescens Nycticorax nycticoras Botarus lentiginosus Ixobrychus exilis Porzana carolina Coturnicops noveboracensis Laterallus jamaicensis Rallus elegans Gallinula chloropus Fulica americana Meleagus gallopavo Squatarola squatarola Charadrius semipalmatus Charadrius vociferus Bartramia longicauda Tringa solitaria Actitis macularia

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Greater Yellowlegs Lesser Yellowlegs Stilt Sandpiper Short-billed Dowitcher Long-billed Dowitcher Ruddy Turnstone Pectoral Sandpiper Dunlin Sanderling White-rumped Sandpiper Least Sandpiper Western Sandpiper American Woodcock Common Snipe Herring Gull Ring-billed Gull Bonaparte's Gull Common Tern Caspian Tern Black Tern

Rock Dove

Mourning Dove

Totanus melanoleucus Totanus flaviceps Micropalama himantopus Limnodromus griseus Limnodromus scolopaceus Arenaica interpres Erolia melanotos Erolia alpina Crocethia alba Erolia fuscicollis Ereunets pusillus Ereunetes mauri Philohela minor Capella gallinago Larüs argentatus Larus delawarensis Larus philodelphia Sterna hirundo Hydroprogne caspia Chlidonias niger

5) S (C) (C) (A)

<u>Columba livia</u> <u>Zenaidura macroura</u>

PASSERINES

Eastern Wood Pewee Horned Lark Barn Swallow Cave Swallow Tree Swallow Bank Swallow Rough-winged Swallow Purple Martin Blue Jay Common Crow Carolina Chickadee Tufted Titmouse White-breasted Nuthatch Red-breasted Nuthatch Brown-headed Nuthatch Brown Creeper House Wren Carolina Wren Long-billed Marsh Wren Short-billed Marsh Wren Mockingbird

Catbird

Contopus virens Eremophila alpestris Hirundo rustica Petrochelidon fulva Iridoprocne bicolor Riparia, riparia Stelgidopteryx ruficollis Progne subis Cyanocitta cristate Corvus brachyrhynchos Parus carolinensis Parus bicolor Sitta carolinensis Sitta canadensis Sitta pusilla Certhia familiaris Troglodytes aedon Thyothorus ludovicianus Telmatodytes palustris Cistothorus platensis Mimus polyglottos Dumetella carolinensis

Yellow-billed Cuckoo Black-billed Cuckoo Chuck-will's-Widow Whip-poor-will Common Nighthawk Chimney Swift Ruby-throated Hummingbird Belted Kingfisher Yellow-shafted Flicker Pileated Woodpecker Red-bellied Woodpecker Red-headed Woodpecker Yellow-bellied Sapsucker Hairy Woodpecker Downy Woodpecker Eastern Kingbird Great Created Flycatcher Eastern Phoebe Yellow-bellied Flycatcher Acadian Flycatcher Traill's Flycatcher Least Flycatcher

Coccyzus americanus Coccyzus erythropthalmus Caprimulgus carolinensis Caprimulgus vociferus Chordeiles minor Chaetura pelagica Archilochus colubris Megaceryle alcyon Colaptes auratus Dryocopus pileatus Centurus carolinus Melanerpes erythrocephalus Sphyrapicus varius Dendrecpus villosus Dendrocpus pubescens. Tyrannus tyrannus Myjarchus crinitus Sayornis phoebe Empidomas flaviventris Empidomax virescens Empidomas trailii Empidomax minimus

Brown Thrasher Robin Wood Thrush Hermit Thrush Swainson's Thrush Gray-cheeked Thrush Veery Eastern Bluebird Golden-crowned Kinglet Ruby-crowned Kinglet Water Pipit Cedar Waxwing Loggerhead Shrike Starling Solitary Vireo White-eyed Vireo Yellow-throated Vireo Red-eyed Vireo Warbling Vireo Black-and-white Warbler Prothonotary Warbler Tennessee Warbler

Torostoma rufum Turdus migratorius Hylocichla mustelina Hylocichla guttata Hylocichla guttata Hylocichla minima Hylocichla fuscescens Sialia sialis Regulus satropa Regulus colendula Anthus spinoletta Bombycilla cedrorum Lanius ludovicianus Sturnus vulgaris Vireo solitarius Vireo griseus Vireo flavifrons Vireo olivaceous Vireo gilvus Mniotilta varia Protonatoria citrea Vermivora peregrina

в-26

Wilson's Warbler Canada Warbler American Redstart House Sparrow Bobolink Eastern Meadowlark Tricolored Blackbird Rusty Blackbird Common Grackle Brown-headed Cowbird Orchard Oriole Baltimore Oriole Scarlet Tanager Summer Tanager Cardinal Evening Grossbeak Rose-breasted Grosbeak Blue Grossbeak Indigo Bunting Purple Finch American Goldfinch Rufous-sided Towhee

Wilsonia pusilla <u>Wilsonia</u> canadensis Setophago ruticilla Passer domesticus Dolichonyx oryzivorus Sturrella magna Agelaius tricolor Euphagus carolinus Quiscalus guiscala Malothrus ater Icterus spurius Icterus galbula Pironga olivacea Pironga rubra Richmondena cardinalis Hesperiphona vespertina Pheucticus Indovicianus <u>Guiraca</u> <u>caerulea</u> Passerina cyanea Carpodacus purpureus Spinus tristis Pipilo erythrophthalmus

B-27

Nashville Warbler Parula Warbler Yellow Warbler Myrtle Warbler Black-throated Green Warbler Black-throated Blue Warbler Yellow-throated Warbler Chestnut-sided Warbler Bay-brested Warbler Blackpoll Warbler Pine Warbler Prairie Warbler Palm Warbler Yellowthroat Yellow-breasted Chat Ovenbird Northern Water Thrush Louisiana Waterthrush Kentucky Warbler Mourning Warbler Hooded Warbler Connecticut Warbler

Vermivora rufiscapilla Parula americana Dendroica petechia Dendroica coronata Dendroica virens Dendroica caerulescens Dendroica dominica Dendroica pensylvanica Dendroica castanea Dendroica striata Dendroica pinus Dendroica discolor Dendroica palmarum Geothlypis trichas Icteria virens Seiurus aurocapillus Seiurus noveboracensis <u>Seiurus motacilla</u> Opornis formosis Opornis philadelphia Wilsonia citrina <u>Opornis agilis</u>

B-28

Savannah Sparrow Grasshopper Sparrow Henslow's Sparrow LeConte's Sparrow Sharp-tailed Sparrow Vesper Sparrow Slate-colored Junco Chipping Sparrow Field Sparrow White-crowned Sparrow White-throated Sparrow Fox Sparrow Swamp Sparrow Song Sparrow Passerculus sandwichensis <u>Ammodromus survannarum</u> <u>Passerherbulus henslowii</u> <u>Passerherbulus caudacutus</u> <u>Ammospiza caudacuta</u> <u>Pooecetes gramineus</u> <u>Junco hyemalis</u> <u>Spizella passerina</u> <u>Spizella pusilla</u> <u>Zonotrichia leucophrys</u> <u>Zonotrichia albicollis</u> <u>Passerella iliaca</u> <u>Melospiza georgiana</u> <u>Melospiza melodia</u>

### AMPHIBIANS

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ACCURATE NO. 2 PURCHASE

Common Name Scientific Name Narrow-Mouthed Toad Gastrophryne carolinensis Eastern Spadefoot Toad Scaphiopus holbrooki Oak Toad Bufo quercicus Southern Toad Bufo terrestris Woodhouse's Toad Bufo woodhousei Common Treefrog Hyla versicolor Spring Peeper Hyla crucifer Green Treefrog Hyla cinerea Barking Treefrog Hyla gratiosa Squirrel Treefrog <u>Hvla squirella</u> Piney Woods Treefrog Hyla femoralis Southern Cricket Frog Acris gryllus Northern Cricket Frog Acris crepitans Least Treefrog Limnaoedus ocularis Brimley's Chorus Frog Pseudacris brimleyi Chorus Frog Pseudacris nigrita Ornate Chorus Frog Pseudacris ornată Green Frog Rana clamitans Pickerel Frog Rana palustris Leopard Frog Rana pipiens-Crawfish Frog Rana areolata Carpenter Frog Rana virgatipes Bull Frog Rana catesbeiana River Frög Rana heckscheri

#### B-30

Greater Siren Lesser Siren Amphiuma Dwarf Waterdog Newt Marbled Salamander Spotted Salamander Dusky Salamander Four-Toed Salamander Dwarf Four-Toed Salamander Mud Salamander Two-Lined Salamander Long-Tailed Salamander Slimy Salamander Siren lacertikla Siren intermedia Amphiuma means Necturus punctatus Notophthalmus viridescens Ambystoma opacum Ambystoma maculatum Desmognathus fuscus Hemidactylium scutatum Eurycea quadridigitatus Pseudotrion montanus Eurycea bislineata Eurycea longicauda Plethodon glutinosus

## REPTILES

3-31

Spiny Softshell Turtle Mud Turtle Stinkpot Box Turtle Spotted Turtle Painted Turtle Pond Sliper River Cooter Slender Glass Lizard Ground Skink

Southeartern Five-Lined Skink

Trionyx spinifer <u>Kinosternon subrubrum</u> <u>Sternotherus oporatus</u> <u>Terrapene carolina</u> <u>Clemmys guttata</u> <u>Chrysemys picta</u> <u>Chrysemys scripta</u> <u>Chrysemys concinna</u> <u>Ophisaurus attenuatus</u> <u>Scincella laterale</u> <u>Eumeces inexpectatus</u> Broad-Headed Skink Five-Lined Skink Green Anole Eastern Fence Lizard Six-Lined Racerunner Pigmy Rattlesnake Timber Rattlesnake Pine Snake Ribbon Snake Garter Snake Scarlet Snake Common Kingsnake Milk Snake Prairie Kingsnake Crowned Snake Red-Bellied Snake Brown Snake Worm Snake Rough Earth Snake Smooth Earth Snake Eastern Hognose Snake Southern Hognose Snake Rough Green Snake Queen Snake Brown Water Snake Common Water Snake

Eumeces laticeps Eumeces fasciatus Anolis carolinensis Sceloporus undulatus Cnemidophorus sexlineatus Sistrurus miliaris Crotalus horridus Pituophis melanoleucas Thamnophis sauricus Thamnophis sirtalis Cemophora coccinea Lampropeltis getulus Lampropeltis triangulum Lampropeltis calligaster Tantilla coronata Storeria occipitomaculata Storeria dekayi Carphophis amoenus Virginia striatula Virginia valeriae Heterodon platyrhinos Heterodon simus Opheodrys aestivus Regina septemyittata Natrix taxispilota Natrix sipedon

Coachwhip

Black Racer

Corn Snake

Black Rat Snake

Eastern Ringneck Snake

Masticophis flagellum Coluber constrictor Elaphe guttata Elaphe obsoleta Diadophis punctatus

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B-34 · MAMMALS

Common Name

Common Opossum Whitetail Deer Eastern Cottontail Marsh Rabbit Common Mole Short-Tailed Shrew Least Shrew Long-Nosed Shrew Gray Fox Red Fox Raccoon Bobcat Common Striped Skunk River Otter Mink Long-Tailed Weasel Hoary Bat Red Bat Seminole Bat Evening Bat Big Brown Bat Rafinesque's Big-Eared Bat Silver-Haired Bat Eastern Pipistrelle

Scientific Name Didelphis marsupialis Odocoileus virginianus Sylvilagus floridanus Sylvilagus palustris Scalopus aquaticus Blarina brevicauda Cryptotis parva Sorex longirostris Urocyon cinereoargenteus Vulpes fuiva Procyon lotor Lynx rufus Mephitis mephitis Lutra canadensis Mustela.vison Mustela frenata Lasiurus cinereus Lasiurus borealis Lasiurus seminola Nycticeius humeralis Eptesicus fuszus Plecotus rafinesquii Lasionycteris noctivagans Pipistrellus subflavus

Keen's Bat Little Brown Bat Woodchuck Southern Flying Squirrel Eastern Chipmunk Eastern Fox Squirrel Eastern Gray Squirrel Beaver Meadow Jumping Mouse House Mouse Norway Rat Eastern Harvest Mouse Common Cotton Rat Eastern Rice Rat Golden Mouse Beach Mouse Wood Mouse Muskrat Pine Vole-Meadow Vole Bear

Myotis keenii Myotis lucifugus Marmota monax Glaucomys volans Tamias striatus Sciurus niger Sciurus carolinensis. Castor canadensis Zapus hudsonicus Mus musculus Rattus norvegicus Reithrodontomys humulis Sigmodon hispidus Oryzomys palustris Ochrotomys nuttalli Peromyscus polionotus Peromyscus leucopus Ondatra zibethicus Microtus pinetorum Microtus pennsylvanicus Ursus americanus

#### FISH OF PARR RESERVOIR

B-36

Scientific Name Common Name Largemouth Bass White Crappie Redear Sunfish Pumpkinseed Sunfish Warmouth Sunfish Bluegill Sunfish Redbreasted Sunfish Longear Sunfish Black Crappie White Bass Green Sunfish White Catfish Yellow Bullhead Channel Catfish Flat Bullhead Brown Bullhead Madtom Carpsucker Quillback Carpsucker White Sucker Spotted Sucker Cyprinus carpio Carp Spotfin Shiner

Micropterus salmoides Poxomis annularis Lepomis microlophus Lepomis gibbosus Lepomis gulosus Lepomis machrochirus Lepomis auritus Lepomis megalotis Pomoxis nigromaculatus Morone chrysops Lepomis cyanellus Ictalurus catus Ictalurus natalis Ictalurus punctatus Ictalurus platycephalus Ictalurus nebulosus Noturus leptacanthus Carpiodes carpio Carpiodes cyprinus Catostomus commersoni Minytrema melanops

C. SALAR STATE STATE STATE

Notropis spilopterus

Common Name Golden Shiner Darter

Longnośe Gar

Gizzard Shad

American Eel

Scientific Name Notemigonus crysoleucas Etheostoma sp Lepisosteus osseus Dorosoma cepedianum Anguilla rostrata

B-37

APPENDIX

EXHIBIT V OF SCE&G'S APPLICATION FOR LICENSE, NATURAL, AND SCENIC VALUES AND RESOURCES

The construction and operation of Fairfield Facility will effect the environment in several ways. Building of the Facility structures and systems and subsequent operation will have a local impact on those natural, historic, and scenic values and resources within the project area, including natural scenery and wildlife habitat, old cemeteries, and archeological sites. SCE&G will take steps to minimize the impact of the project construction and operation as explained in the following paragraphs.

Many people feel that an undisturbed natural landscape possesses beauty and, thus, is aesthetically pleasing. At the same time, most people are aware of the human comforts that are made available to them through the generation of electrical energy. Ultimately, certain environmental effects must be accepted as unavoidable in the provision of electrical energy. It is emphasized that all effects are not necessarily adverse; and that those which are adverse will be minimized to the extent feasible. Furthermore, programs to monitor effects on the environment and management of land resources to minimize and offset adverse impact and to improve existing resource conditions will be undertaken as outlined in Section 2.2.5.3 of the Environmental Report. The proposed Fairfield Pumped Storage Facility will be located on Frees Creek in Fairfield County, in an area which is sparsely populated, and which is not easily accessible to the public. The Fairfield Powerhouse, as shown on the following page, is designed to contrast pleasantly with and to complement the natural surroundings. Both the powerhouse and the penstocks present sleek, lowprofile lines, and nestle into the surrounding hillsides with few visible protrusions. The long, straight line of the penstocks leads the eye up and away from the powerhouse and into the nearby hills.

The Fairfield Powerhouse will remain the color of natural concrete. The penstocks will be painted a color aesthetically compatible with the natural surroundings. The necessary outstanding features, such as cranes and generator covers, will be painted green and brown to harmonize with local natural colors. Landscaping and planting of the dams and areas around the powerhouse which are disturbed by construction will be as natural as possible, and will consist of trees and shrubs common to the local area. SCE&G will work with the U. S. Department of Agriculture Soil Conservation Service - Fairfield Soil and Water Conservation District to plan appropriate types of planting for all areas within the project boundary other than transmission line rights-of-way, which are covered in detail later in this exhibit. (See letter and contract at the end of Exhibit V.) Also, the irregular shorelines of Parr and Monticello Reservoirs and the general remoteness of the site will limit exposure of the facility.

The addition of bascule gates to Parr Dam will add approximately

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nine feet to the height of the dam, as shown on the following page. The most significant visual change resulting from the addition of the gates will be the broadened water area behind the dam.

The impoundment of Monticello Reservoir will change the site from one of a predominantly forested, hilly view to that of a broader water view. This will have the result of creating a somewhat more expansive view due to the relective character of the impoundment surface.

Water level fluctuations in Parr Reservoir and Monticello Reservoir will periodically present some unsightly mud flats and bared shoals. The greatest water level fluctuations will occur in Parr Reservoir (about ten feet) and will expose a substantial amount of near shore bottom land. The visual impact of these exposed areas will be mitigated somewhat by the fact that the lowest water levels will occur largely at night when the Fairfield Facility is operating in the pumping mode. The impact of the exposed shoreline in Monticello Reservoir will be limited since the water level fluctuation will be on the order of four and one-half feet.

During project construction, SCE&G will require the contractor(s) to employ specific construction practices at the site, including those associated with minimizing environmental effects. Some of the measures that will be used are:

 Soil erosion procedures: These will include such features as reducing the area and duration of exposed soils to a minimum, retaining and protecting the natural vegetation whenever possible, and installation of conduits and settling basins. A

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storm water drainage system will be installed as soon as practicable.

 Dust control: Dust control measures will consist of frequent water sprinkling of roads, parking lots and construction staging areas.

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Other erosion control procedures used by SCE&G will include the development of appropriate temporary and/or permanent ground cover such as planting the downstream faces of the dams, replanting construction lay down areas, and placing rip rap on the upstream faces of the dams where support for vegetation growth is unavailable. Prior to initiating licensed project construction activities SCE&G will prepare job specifications that will include the recommended practices for soil and water conservation as advised by the Fairfield County Soil and Water Conservation District office located in Winnsboro, South Carolina.

Borrowing will take place in the cleared Monticello Reservoir area, so that when the project is completed, there will be no unsightly scars on the landscape. It is planned to dispose of dredge spoils by placement behind nearby embanked areas. After the water drains, the areas will be planted with appropriate vegetation consistent with the precepts of the Land Management Program discussed in Section 2.2.5.3 of the Environmental Report.

Construction debris which cannot be salvaged and used may be disposed of in several ways. For the trash and materials which are combustible, appropriate permits from the South Carolina Pollution Control Authority and the South Carolina Forestry Commission will be obtained. These materials will be placed in carefully constructed areas within the boundary of Monticello Reservoir, and burned under proper supervision. Fire-fighting equipment will be available on-site. For the incombustibles the alternatives are hauling, burial, and special use. It has been SCE&G's practice to maintain "clean jobs" and, therefore, unsightly materials which have no use will either be transported to a state-approved disposal site or disposed of by burial or other appropriate means. As part of the Land Management Program an evaluation will be made to see if this debris can be used in the upper impoundment as fish habitat materials.

There are likely to be some chemicals used whose disposal will need special consideration. As on other projects of this type, pipelines and other materials may require flushing with alkaline chemical solutions. The resulting waste will be placed in a lagoon of state approved design for simultaneous neutralization. The waste products from the field coating of tanks, sandblasting materials, possible acid etching wastes and the muriatic acid wastes from concrete treatment will also be put into this holding lagoon. As required, liquid wastes will either be hauled away or mixed with neutralizing agents and covered over with earth in accordance with State regulations.

The operation of construction vehicles will result in the byproducts of diesel air emissions and waste oils and gasoline, and all construction activities will create noise; however, because of the remote location and sparse population, the impact on the human environment should be minimal. There will also be possible noise and traffic congestion entering and leaving the job site, particularly at starting and quitting time; but, these effects

should be confined to the immediate locale.

Construction and operation of the Fairfield Facility will have some unavoidable adverse effects on the land and wildlife resources in the project area. To alleviate the removal of woodland habitat, plans are being developed to create and improve other woodland habitat, to set aside appropriate areas as wildlife preserves, and to establish a waterfowl management program. These are discussed in Section 2.2.5.3 of the Environmental Report. Thus, SCE&G Co. will be undertaking measures to enhance or improve upon the existing resources, where practical and compatible with the operation of the Fairfield Facility.

Transmission lines to be built in connection with the project consist of the Fairfield-Summer 230 KV tie lines (two lines) and in addition, impoundment of Monticello Reservoir will require the relocation of a portion of a 100 KV double circuit steel tower, Duke Power Company transmission line. The proposed right-of-way locations for these lines are indicated on Exhibits K-2 and K-8. Slight adjustments and modifications may be made to the locations of the proposed rights-of-way when location surveys are made.

The proposed transmission lines will be constructed in a rural area which consists of hilly, rolling terrain. In Fairfield County, where these lines will be located, forest land occupies about 80% of the total land area. The next predominant lan. use is agricultural (crop land plus pasture), accounting for about 13%. Surface soils are typical of those encountered in the Piedmont region, and consists generally of stiff reddish-brown silts and clays. Maximum relief over the rights-of-way is on the order of 200 feet,

. C-8 ranging from Elevation 460 feet MSL to about Elevation 260 feet MSL near Fairfield Powerhouse.

The closest towns are Jenkinsville and Monticello, which are small unincorporated rural communities. In Fairfield County, the total estimated population (1970 Census) was 19,999 with an average density of less than 30 people per square mile. No increase in population in the general area is expected in the next 40 years; in fact, a decrease is anticipated.

No parks, national forests, or designated scenic, recreational or wildlife areas are near the proposed transmission lines routes. The closest approach of Sumter National Forest to the transmission line rights-of-way is about four miles. The proposed rights-ofway do not infringe upon any national or local historic areas or landmarks. The Davis Plantation, the closest area of historical importance (listed in the National Register of Historic Places) is approximately five miles away from the closest approach of the proposed rights-of-way.

The Fairfield-Summer 230 KV lines will connect the Fairfield Pumped Storage Facility to the Virgil C. Summer Nuclear Station and will be approximately one mile in length. The structures will be of wood H-frame construction, and it is estimated that approximately 8 structures per circuit, or a total of approximately 16 structures, wi be required. A drawing of a typical tangent H-frame structure is sho on the following page. The right-of-way will be about 170 feet wide, requiring a land area of approximately 20 acres. Wood Pole structure will be about 65 to 70 feet in height. The proposed tie line will be



constructed in a forest area entirely within the exclusion zone (approximately one mile radius) of the Virgil C. Summer Nuclear Station The land along the proposed right-of-way is owned by SCE&G. No roads are crossed by the proposed Fairfield-Summer line, and the closest residence is more than one mile away.

The existing Duke Power Company line crosses the proposed Monticello Reservoir in an approximate east-west direction starting at the north abutment of the main Frees Creek Dam, as shown on Exhibit K-2. The relocated line will start south of the north abutment and will pass on the down stream side of the main Frees Creek Dam, cross over the intake channel of the Fairfield Powerhouse, pass the Virgil C. Summer Nuclear Station on the reservoir side, cross over the access road to the nuclear station at two locations, and cross State Highways 215 and 213 before tying back into the existing line east of Highway 215. The proposed right-of-way of the relocated Duke Power line will be approximately 5 1/2 miles in length. Double-circuit lattice-type steel towers, similar to the towers on the existing line, will be utilized. There will be an average of about eight towers per mile. The right-of-way will be approximately 100 feet in width, except along the portion of the right-of-way between the Fairfield Pumped Storage Facility and the Virgil C. Summer Nuclear Station, where the Duke line will utilize the same right-of-way as the Fairfield-Summer tie line for a distance of about 2000 feet. The proposed routes of the Fairfield-Summer tie lines and Duke line relocation were selected to permit the maximum practical use of a common right-of-way. The common right-of-way will be approximately 240 feet in width. Where the Duke line relocation passes the nuclear station, the

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structures will be constructed on small fingers of fill extending out from the shoreline. An estimated 60 acres of new right-of-way will be required for the relocated Duke line. The proposed structures will be on the order of 85 feet in height.

The proposed right-of-way for the relocated Duke line will be constructed in a predominantly forest area. About 50% of the proposed right-of-way will be constructed within the Virgil C. Summer Nuclear Station exclusion zone. Beyond the exclusion zone, the proposed right-of-way will pass near an estimated 15 to 20 residences; however, most of these residences will be more than a few hundred feet from the right-of-way and no residence is expected to be closer than 200 feet from the proposed right-of-way. A few small open areas will be crossed by the proposed right-of-way.

The proposed relocated line will be owned, operated and maintained by Duke Power Company. A portion of the right-of-way is on lands owned by SCE&G. Negotiations are presently underway to obtain other portions of the right-of-way.

In addition to the relocation of that part of the Duke double circuit steel tower line in the area of the Monticello Reservoir, it will be necessary to raise this line where it presently crosses the Parr Reservoir, (Broad River). The present clearance of this line over the existing reservoir level is approximately 42'. Since the level of this reservoir is to be raised approximately 9' by increasing the height of the Parr Dam, it is planned to raise the elevation of the transmission line at this crossing  $\nu_i$  12' which will provide a clearance of approximately 45' over the new level of the reservoir. This will be accomplished by the construction of new foundations

and raising the existing steel towers at their present locations. The estimated cost of raising these two towers is \$50,000.00.

The environmental impact of the proposed transmission lines on population and land use is judged to be slight. The Summer-Fairfield tie lines will be constructed in a hilly, forested area that is remote from any residences. About half of the relocated Duke line will also be constructed through an area which is remote from any residences, and the remaining portion will pass through a rural area that is generally sparsely populated. In these areas, it is planned that the proposed relocated Duke line would pass no closer than 200 feet from existing residences. The proposed lines, therefore, should have practically no effect on the residences in the area from a safety or a nuisance standpoint. Since the proposed rights-of-way will not pass through cultivated land areas, there will be no impact on agricultural activities.

It is estimated that more than 95% of the proposed rights-ofway will pass through forested areas. Forestry products represent a significant source of income (24.3% in 1969) in Fairfield County from farm marketings, but the total land area required by the rights-of-way for the proposed lines will amount to only about 0.02% of the total forested land in the county. The main effects of clearing the rights-of-way through the forested areas would be related to disturbance to a small part of the natural setting and resulting changes in wildlife habitat.

The dominant stand type in the forested land surrounding the proposed rights of way is a coniferous species, the loblolly pine. Other species found in the upland environment include the white oak, red oak, and hickory. In the lowlands and bottoms, the species found

include cottonwood, sweetgum, nuttal oak, willow oak, and white ash.

The ground cover species include a predominance of honeysuckle and greenbriar. Dense ground cover is not abundant because of the great density of deciduous and coniferous stand types. Historically, the growth of pine and hardwood in the area is tied to the decline of cotton and grain crops in the early 1930's. The revegetation is largely a result of public revegetation programs of the WPA and CCC.

Terrestrial wildlife field surveys in the general area during 1971 and 1972 have identified or received confirmed reports of 13 species of mammals and approximately 65 species of birds. The mammals include species of shrew, mice, and rats, eastern cottontail rabbit, gray squirrel, raccoon, bobcat, and whitetail deer. The southern cougar, which had not previously been known to exist in the area, was recently sighted. The game species of most importance in the area is the deer. Mammals are more abundant in the bottomlands, areas where hardwoods or mixed conifer-hardwood associations provide a more varied habitat and food supply. The proposed transmission rights-of-way mainly traverse stands of conifers, and these routes are expected to have fewer mammals than a route through predominantly hardwoods. Results of small mammal trapline surveys in the study area have shown few rodents in conifer transects compared to mixed hardwood or cutover transects. It is expected, therefore, that carnivorous animals, such as bobcat, that may feed on the rodents would be less abundant along most of the proposed route. Bird species in the general study area include a great many of the small native song birds, migratory waterfowl, heron, dove, quail, turkey and raptors. Turkey populations have
been increasing in the Broad River area, and these birds along with quail and dove are the main species of sport interest. Since most of the transmission line route is away from the water's edge, fewer species of birds are expected along the transmission line route.

The clearing of the rights-of-way through the dense stands of pine and hardwood will provide a margin or partial firebreak for the protection of the surrounding forested areas during fire conditions. This is a beneficial impact resulting from transmission line construction.

The clearing of the proposed transmission line rights-ofway will create a margin or "edge" which will enhance production of wildlife in the general area of the rights-of-way. This enhancement takes the form of increased understory vegetation which provides a greater variety and abundance of food and cover for the wildlife than previously available. The "edge effect," in turn, increases the "carrying capacity" of the land by providing food for more animals than would otherwise be able to live in the area.

The elimination of "danger trees" (trees tall enough to potentially fall and interfere with the power lines) within close proximity to the transmission line rights-of-way, will serve to reduce the vegetative cover in addition to that removed for construction. This removal will serve to clear the margin of forest canopy adjacent to the rights-of-way and will allow more light to enter the cleared area as well as the margins of the forested area and thus effectively extend the edge effect benefits.

It is concluded that the creation of a cleared zone through the predominantly pine stands would have an overall beneficial effect with regard to the wildlife of the area. Additional measures will be taken, however, to insure that the changes brought about are of a positive nature for habitat improvement of desired species. These measures are discussed in subsequent paragraphs.

One of the most important effects on the environment due to construction of the proposed lines would be related to aesthetics. An evaluation of this impact, however, is difficult to make, even in a qualitative manner, since there obviously can be many diverse points of view depending upon an individuals background and experience. Evaluation of the aesthetic impact of transmission line construction has been based on the premise that, regardless of an individual's opinion of the transmission lines, he must first see it in order to react; that is, it must be so apparent within his range of perception that he cannot help but take note of its presence. Therefore, one method to evaluate the impact of transmission lines on aesthetics is to consider its ease of visibility from vantage points which would be ordinarily available to the largest proportion of people living in or traveling through the area. The ease with which people would be able to see the transmission lines varies with distances from the line and whether their views are screened by intervening hills, vegetation or other obstructions.

The Fairfield-Summer tie lines will be constructed in a remote forested area within the Virgil C. Summer Nuclear Station exclusion zone, away from residences and roads. Thus, the opportunities to view the line would be restricted. Along a short length of the line, the upper portion of one or two structures may be visible from boats on Monticello Reservoir. Boating activity in the lower portion of Monticello Reservoir, however, is expected to be slight, since it is anticipated that most of the recreational activity will be in the upper portion of the reservoir or in the sub-impoundment recreational and fishing area. An area on the north side of the Frees Creek tailrace will be set aside for future recreational use (see Exhibit R-3), and it would be possible to view portions of the line from this location. It may also be possible to view portions of the transmission line from Parr Reservoir. The closest approach to the transmission lines, however, would be a few thousand feet where the tailrace enters Parr Reservoir. Present use of the reservoir for boating is very limited, however, and because of the fluctuations during operation of the pumped storage facility, recreational use of Parr Reservoir is expected to diminish. From this standpoint, the aesthetic impact of the proposed Fairfield-Summer tie lines would be minimal.

In general, there will be little opportunity for the general public to view the relocated Duke transmission line. Along that length of the line located below Frees Creek dam and running towards the nuclear station, the upper portions of certain transmission towers will likely be observable from Monticello Reservoir. Portions of the line would also be observable from the future recreational area north of the tailrace and possibly from Parr Reservoir. There would also be a possibility of viewing the relocated line where it passes near the nuclear station along the shore of the Monticello Reservoir. As previously stated, however, the number of

people viewing the line from these areas is expected to be small. Within the exclusion zone, the Duke line crosses the access road to the nuclear plant at two locations. Public travel on this road, however, is not expected to be significant.

The most significant visual impact of the relocated Duke line will be at the crossings of State Highways 215 and 213, which are light to moderately traveled two-lane roads. Steps will be taken, however, to mitigate the visual effects of the transmission line crossing, as described in a subsequent paragraph.

In evaluating alternative rights-of-way locations, selecting measures to minimize environmental impact and to provide for environmental enhancement where feasible, the criteria presented in FPC Order No. 414 and the U. S. Department of Interior and Department of Agriculture booklet, "Environmental Criteria for Electric Transmission Systems" were utilized as guides. Various alternative routes were considered for the proposed transmission rights-of-way.

The consideration of alternate routes for the location of the two tie lines from the Fairfield Pumped Storage Plant to the Summer Nuclear Station was constricted by the short length of these lines which will be approximately one mile. This short length made it impractical to consider the construction of the two lines on separate rights-of-way. Also, the location of the two lines on a common right of-way will require less total acreage and consequently will require less clearing. The locations of the terminal structures for these two lines at Fairfield and Summer have been established by the sub-station design and other construction factors. The

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first route considered for these lines was a direct, straight line between the terminal structures. This route would obviously result in the shortest possible length and probably the lowest cost. Inspection of this route showed it crossed near the top of some ridges or hills where it may be visible from the reservoir. It also crossed over or near the construction areas for some of the dam sites for the Monticello Reservoir. For these reasons it was deemed unsuitable.

We next considered a route which basically followed the lowest practical contours and valleys. We selected this route to minimize the visual impact of the tie lines. This particular route, however, required approximately 5 angles and was much longer than the direct route. This would require more right-of-way and more clearing, but it would eliminate long tunnel views along the line. It would require, due to the added length, more structures and be more expensive to construct.

A third route was considered. This route was a compromise between the first and second routes. This route is located below, in so far as practical, the crests of ridges and avoids hill tops. It generally uses contours which are below the dam crests by an amount equal to or greater than the anticipated maximum structure height, therefore providing a high degree of visual screening from Monticello Reservoir Three angles are used to minimize tunnel views. The length of the lines is less than the lower route, resulting in less acreage for right-of-way and less clearing. The reduced length will also result in a lower cost and possibly fewer structures.

Underground cable was also considered. We determined that for

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reliability, 3 cables would be required, two for normal operations and one for use in the event of failure on either of these two cables. The cost of the necessary switching devices and associated equirment, installed, plus the cost of the cable in place is estimated to be over 15 times the cost of the overhead lines. The route would involve a change in elevation of about 145' (from elevation 435 to elevation 290) and cross some ridges and valleys. In order to place these cables, the vegetation along the route will be cut and removed or otherwise destroyed. This, coupled with the slopes involved and the type soil in the area will result in erosion problems somewhat greater than the overhead type construction.

Due to the problem of erosion, the fact that the route must be cut through wooded land, the high costs of this method and the fact that an overhead route is in close proximity, it was decided not to use the underground construction.

After careful weighing of visual considerations, the amounts of right-of-way involved, amount and methods of clearing, costs, and proximity to other construction, the third overhead route was selected for the Fairfield-Summer 230 KV tie lines.

Alternative routes evaluated for the relocated Duke line included:

- 1. Construction of the relocated line in its present position.
- 2. Relocation of the line a maximum of 3500 feet south of the present location to utilize islands and shallow water areas.
- 3. Relocation of the line around the west and north side of the Monticello Reservoir.

4. Routing of the line to the south of Virgil C. Summer Nuclear Station, utilizing the existing 115 KV Parr-Midway right-of-way and the existing 115 KV Parr-Winnsboro right-of-way to the maximum extent practical. Alternatives 1 and 2 were considered to be infeasible because of the high costs (approximately \$1,800,00 for both alternates versus approximately \$500,000 for the right-of-way as planned); also, construction of the line across Monticello Reservoir would result in an adverse visual impact and and an additional danger to boating. Alternative 3 would require an additional seven miles of right-of-way with an estimated total cost of \$1,300,000. Furthermore, many road crossings would be made, increasing the possibilities of public viewing. For Alternative 4, the advantages gained by utilizing existing transmission line rights-of-way were more than offset by the additional distance and land required. This alternative would also necessitate crossing under nine or more transmission lines emanating from the substation of the Virgil C. Summer Nuclear Station. In evaluating alternative routes for the relocated Duke line, the proposed right-of-way was selected as representing a reasonable balance between environmental impact considerations and engineering and construction considerations. While SCE&G believes that the proposed transmission line rights-of-way are optimum solutions which minimize environmental effects, additional measures will be undertaken by the Company to further reduce environmental impact and to provide for environmental enhancement.

Since the Fairfield-Summer tie lines are in a remote, forested area, there would be little possibility of people viewing these lines Nevertheless, SCE&G plans to use wood H-frame construction for this line so that there will be maximum compatibility with the environment The generally low height of the poles (65 to 70 feet) would also provide for maximum screening. The proposed right-of-way was kept as

low as practicable on the slopes of hills to reduce visual impact.

In general, the right-of-way selected for the relocated Duke line results in screening of most of the line from the view of travelers in the area by trees, vegetation, high ground; or would usually be at a distance great enough to reduce visual impact. At the crossing of State Highways 215 and 213, where the line will most frequently be viewed, measures to reduce the visual impact will consist of a change in alignment, screen planting in the right-of-way at the road crossing or leaving in of existing vegetation to provide screening. Road crossings will also be made at low points if practicable to reduce visual impact. The proposed right-of-way has been kept as low as practicable on hillsides and well back from travelled roads (Highway 215) to provide for maximum screening.

The clearing of rights-of-ways will be performed in accordance with the guidelines contained in FPC Order #414 as completely and conscientiously as practicable. Rights-of-way clearings will be kept to the minimum width necessary to prevent interference of trees and other vegetation with the proposed transmission facilities. In scenic areas a concept of selective clearing will be followed wherever practicable, and only those trees which could cause damage to the transmission lines will be cleared. Trees and other vegetation cleared in areas of public view will be disposed of and stumps will be cut close to the ground line. Grass and other ground cover and all topsoil will be protected from damage as completely as precticable during construction. At road crossings and other special locations exposed to frequent public view, particular care will be used to allow

small trees and plants to remain in place and, if necessary or appropriate, additional plantings of suitable shrubs will be made to establish an acceptable screen on the rights-of-way. Where practicable, plantings would be arranged with taller plants along the edge of the right-of-way and successively small plants and grass toward the centerline. These procedures are expected to provide maximum erosion protection along the rights-of-way while also enhancing habitat in the area.

Access roads to the rights-of-way will be kept to a minimum. It is SCE&G's policy not to construct roads to gain access to the rights-of-way; existing roads are used to the maximum extent possible. Construction operations will be monitored by SCE&G to assure that all construction debris is removed from the rights-ofway when construction is completed. Burning of vegetation will be performed in accordance with South Carolina Pollution Control Authority standards. When temporary access roads have been constructed which are not needed for maintenance purposes, they will be obliterated and restored to the original slopes and natural ground cover replanted. No extensive cuts or fills are planned along the rights-of-way. For the most part, the rights-of-way will follow the natural ground contour; any grading which is done will conform with the terrain and adjacent land.

Members of the South Carolina State Archives and Historical Department indicated that there are three places of historical importance near the project area. (See correspondence at the end of Exhibit V.) These include two homes, Fonti Flora and the Davis Plantation and the Monticello Church. (See Exhibit K-8) Of these, the Davis

Plantation is listed in the <u>National Register of Historic Places</u>. None of the three locations will be affected by the project. The Fairfield County Historical Society mentioned the historical importance of cemeteries in the project area. There are five small, now abandoned cemeteries which will be relocated and marked in a socially acceptable manner. (See Exhibit K-8)

Dr. Robert Stephenson, State Archeologist, indicated that there are four recorded archeological sites within or near the boundary of the proposed project (See Appendix A, Environmental Report, and Exhibit K-8). This concentration of archeological sites within a small area suggests that others may be present, and Dr. Stephenson recommended that two of the sites be excavated and that prior to construction a detailed survey be made of the area to discover if additional sites exist. SCE&G will support and finance a study to be conducted by the University of South Carolina Institute of Archeology and Anthropology amounting to approximately \$10,000. (See correspondence in Appendix A of the Environmental Report.)

There are a number of parks and recreational areas within the general region of the proposed project. Within ten miles of the site, however, the only significant public land available for recreational use is the Enoree Division of the Sumter National Forest, a portion of which is within six miles of the site. These areas provide recreational activities including picnicking, hiking, hunting, and limited boating and fishing, none of which will be affected by the project.

Hunting is a major visitor use, and there are two successful private waterfowl hunting clubs owning covelands upstream. These clubs are cooperators in the Broad River Waterfowl Management Program.

Since the lowlands may be affected by the increased water level of Parr Reservoir, discussions will be held with these clubs concerning the possible effects of the project.

According to preliminary data, the increased elevation of Parr Reservoir will flood certain properties of the U. S. Forest Service located upstream near Terrible Creek. Plans have been drawn for a waterfowl habitat area on Terrible Creek and development is expected soon. SCE&G has made contact with the U. S. Forest Service concerning the possible effects of the project on this development. Further discussions will be held as project plans are solidified, and SCE&G will cooperate with the U. S. Forest Service on a value for value land exchange as found mutually agreeable.

Impoundment of Monticello Reservoir and raising of the existing Parr Reservoir will require the relocation of portions of Route 99 where it crosses the north end of the Monticello Reservoir, and a small section of Route 215 on the west shore of Monticello Reservoir. The roadbed of S. C. Highway 28 approaching the bridges across Cannon's and Heller's Creeks will have to be raised to accommodate the daily water fluctuations of Parr Reservoir. Dependent on final topographic surveys, bridge approach sections of S. C. Highway 97 may also require raising. Negotiations are underway with the South Carolina Highway Department concerning these road relocations. SCE&G will coopeate with all appropriate State and Federal agencies to minimize the environmental impact of these highway relocations.

The enlargement of Parr Reservoir will require the relocation of a portion of the existing Southern Railroad line on the

east bank of the Broad River crossing Frees Creek, and modifying the existing road bed for several thousand feet adjacent to the river. SCE&G has contacted the Southern Railway concerning this matter and is currently working with consultants of the Southern Railway on the required relocations and modifications.

Care will be taken to see that the above relocations create as little distrubance to the natural landscape as possible, and have minimal environmental impact. SCE&G will cooperate with all State and Federal agencies involved with the construction and relocation of all highways and railroads.

Estimated costs of preserving and enhancing natural, historic, and scenic values and resources in the construction and operation of the Fairfield Pumped Storage Facility are as follows:

NAMES OF THE OWNER

To be completed at a later date.

Should the construction or operation of the Fairfield Facility produce any unforseen adverse effects on natural, historic, or scenic values and resources, SCE&G will cooperate with the involved persons or agencies to alleviate the impact of the project.

# Appendix D

FISH AND WILDLIFE HABITAT DATA FOR THE PROJECT AREA

There are four basic aquatic habitat types represented in the project area that may be affected.

(a) A section of the free flowing Broad River above the present Parr Reservoir level.

This 23 km section of the river is relatively constant in width (ranging from approximately 350 to 700 feet) and has a low gradient of less than 1 ft per mile. The river is generally shallow with maximum depths of less than 20 feet and much of the river of five feet or less.

There is little to no aquatic macrophyte growth in the river, however, the banks are characteristically grassy with trees near the edge or overhanging the water. Banks are generally steep-sided, and there are few islands in this section of the river.

Bottom types vary from silty sand in the slower areas to sand in the more scoured areas. Rocks occur infrequently and are primarily in the area immediately below Henderson Island. Downed trees occurred along the river bottom.

This section of the river is suitable for a variety of fish species that prefer moving water and provides little quiet water and back eddies. It is suitable spawning area for many fish species that require moving water and firmer bottoms than are present in Parr Reservoir.

(b) A semi-free flowing habitat within Parr Reservoir.

Because of a siltation and shallowing a large part of Parr Reservoir has become riverine in nature and experiences water movements similar to the river but of generally lesser magnitude. The riverine habitat within Parr Reservoir ranges from a relatively straight narrow upper end with few islands to larger open areas characterized by vegetated islands and shifting shallows and backwaters.

Reservoir width varies greatly, from approximately 500 feet at its upper end to 2,800 feet near the dam. Depths may be 20 to 25 feet, in the channel near the dam, but most of the lake has depths averaging only 3-4 feet.

The bottom is primarily silt, sand and muck with many submerged or semi-submerged trees. The sides are often steep and overhung by trees.

This section of the river provides habitat for all species of fish known to be in the reservoir, but is probably less productive than embayment portions.

(c) Embayment habitats within Parr Reservoir

Frees Creek, Hellers Creek, and Cannons Creek embayments are the major representatives of this lentic type of environment. Together they form about 22% of the total Parr Reservoir surface acreage.

Embayment widths vary from a few hundred feet to nearly 3/4 mile, and in length from 0.6 to 5.3 miles. Channel depths are 12-15 feet, however, depths just out of the channel quickly change to 4-6 feet and become shallow toward shore. Embayments are characterized by little current flow, an abundance of submerged partly emerging dead trees, and the variable influence of their small feeder streams.

Banks are generally only moderately to slightly steep and often overhung by trees which extensively shade the margins. Bottoms are silty, becoming more sandy as the creek mouth is approached.

These embayments are generally richer in fish habitat than the more open water, however, Cannons Creek Embayment appears to support several times the standing crop of fish than does Frees Creek Embayment.

(d) The free-flowing portion of Frees Creek

About 7 miles of Frees Creek will be affected. This small stream flows from an elevation of approximately 450 feet and has an average drop of about 20 feet per mile. The drop is greatest in the upper 1/4 of the creek, averaging 33 feet per mile and lesser in the lower 3/4, averaging 12 feet per mile.

The stream is small, the width averaging 10 feet or less. Water depth is generally less than a foot and is usually a few inches. There are some deeper pools formed around branches and debris, but most of the creek is riffle or shallow pool. The stream bottom is generally of sand, ranging from coarse to fine. There is very little rock and thus the bottom tends to be unstable.

The creek runs through a mixed deciduous and pine forest and is heavily shaded. No rooted macrophytes are present. In contrast to the Broad River, Frees Creek is often clear, and turns trubid only after heavy rains.

The stream appears to provide poor fish habitat because of its shallowness and shifting bottom. No fish from Parr Reservoir are known to use Frees Creek as a spawning area.

	Category	Shoreline Miles*	Acreage
(a)	Broad River	16	740
(b)	Reservoir without		
	embayments	18	2,300
(c)	Embayments	11	660
(d)	Frees Creek	14	·

\* Includes both sides of the stream or embayment.

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There are four terrestrial habitat types within the project area that may be affected.

Four major habitat categories were identified on the project area and include the following: pine plantation, mixed pine-deciduous woodlands, deciduous woodlands, and grasslands (cultivated and abandoned farmland). The approximate percentage of each major type that will be inundated by the project impoundments is as follows:

Parr Reserve	oir	Monticello Impoundmen					
Pine	28	47%					
Mixed	88	26%					
Deciduous	86%	15%					
Grasslands	48	12%					

The quality of the woodland communities to support a diverse and an abundant fauna is dependent upon the site characteristics, age structure of the forest, and density of the canopy. These factors have a direct influence on the development of herbaceous vegetation and shrubs which, in turn, is part of the life-support system of woodland wildlife.

The site characteristics that influence lower story productivity include the slope, moisture retention properties, and organic content of soils. Pine plantations usually occur on the upland sites that are well drained and slightly acidic (pH 5.0 to 5.5). The nutrient levels in the uppermost soil layer are not well developed because pine needles decompose slowly. Deciduous leaved shrubs and herbaceous vegetation do not grow readily in these mildly adverse conditions.

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The deciduous leaved tree sites, along the Broad River and tributary creeks, are moderate to poorly drained and provide a better substrate for the growth of herbaceous or shrub vegetation. The decomposition of deciduous leaves results in more nutrients available and an improved nutrient exchange between the soil and vegetation.

The age-structure and density of a forest influences the penetration of sunlight to the forest floor. The amount of sunlight that reaches the substrata is reduced in a mature and/or even-aged stand of trees having a dense canopy. A stand composed of uneven-aged trees will allow sunlight to reach the substrata more readily.

The monitoring program included the analysis of vegetation on five study sites representative of the four major communities on the project area. The five sites include the following: two sites in pine plantations of two different-age classes, one site in a mixed pinedeciduous community, one in a predominantly deciduous

D-8 .

forest, and one site in a grassland where pine seedlings had been planted. All five sites are in the vicinity of the Monticello Impoundment. Each habitat community is described in more detail in the following paragraphs. <u>Pine Habitat</u>

The coniferous communities to be inundated consisted mainly of loblolly pine which produces a closed canopy forest with a sparse understory of herbaceous vegetation. Only limited numbers of pine seedlings and saplings are capable of growing under the dense canopy which reduces light penetration to the substrate.

Two pine plantations representative of the project area were described by the following techniques: the point-centered-quarter method was used to obtain relative density, relative frequency, and relative dominance of trees over 2.5 cm d.b.h.; diameter at breast height (d.b.h.) was measured to characterized age-classes; and the frequency of occurrence was obtained for shrubs, herbaceous vegetation and other ground species from 40 one-meter square quadrants systematically placed in each habitat. Tables 1 and 2 show the diversity and the relative frequency, density, and dominance, and importance value for trees found on the two pine plantations sampled. Loblolly pine is the most importanct species on both sites. Herbaceous and woody vegetation is not abundant on

D-9

either site (Table 3). In the first pine plantation, Schribner's panicum, blackberry and dandelion occurred in more than 25 percent of the quadrants. The second pine plantation sampled shows a greater diversity and frequency of herbaceous and woody vegetation. The understory vegetation in the second plantation was studied one year following the selective removal of the mature pine for pulpwood.

The quality of the pine communities in regard to supporting wildlife is considered to be very poor because of the sparse understory. Neither shelter, forage nor browse was significantly available to wildlife.

A variety of songbirds were recorded in pine plantations during two seasons (Table 4). The density of birds was low in the pine plantations. Game birds such as turkey and bobwhite are also low in abundance because the available nuts, fruits, seeds and shelter is sparse.

Small mammals were censused in two pine plantations for five days in each of four seasons (Table 5). Of the total small-mammals collected, seventy-eight percent were in the second pine plantation where the understory vegetation was more abundant. Golley, et al. (1965) also found small mammals to be low in abundance in pine plantations.

D-10

No furbearing or game mammals were observed or trapped in pine plantations. Cottontail rabbits, however, were occasionally seen near an ecotone between a pine plantation and grassland where food and protective cover were more plentiful. Browse for white-tailed deer is very sparse in pine plantations with only limited amounts of Walter's smilax, honey-suckle, blackberry, and dogwood.

### Mixed Pine-Deciduous Habitat

Of the mixed pine-deciduous communities to be inundated by Monticello Impoundment, 73 percent consists of areas where pine was selectively removed. The hardwood understory was predominant on aerial photographs, resulting in those areas being classified as mixed pine-hardwood community.

The mixed pine-deciduous study site was located along the sloping shoreline of Frees Creek, near the Broad River. Loblolly pine, eastern red cedar, and red maple were the most important species (Table 6). Loblolly pine was the dominant species within the area, but eastern red cedar was the most dense.

A variety of species comprised the understory with Walter's smilax being the most frequent woody plant and sedge the most frequent herbaceous plant (Table 3). The understory was diverse because sunlight could penetrate the multi-aged diverse forest to reach the understory and substrate and deciduous leaves provided a better humus layer on the soil.

The quality of the "mixed" habitat for wildlife is probably fair but limited in distribution as ecotones between pine plantations and the deciduous forests on the bottomlands. The distribution of "mixed" habitats on the project area and the low frequency of potential food plants is representative of the over-all low quality of the project area for native wildlife species. The understory vegetation includes a variety of plants valuable as browse or food for white-tailed deer, turkey and bob-white quail. However, none of these species were abundant.

Native wildlife populations in the "mixed" community were low in abundance. Song birds were more abundant in pine habitat than "mixed" habitat (Table 4). However, the "mixed" habitat, where bird were censused, contained significantly more mature deciduous woodland habitat than pine habitat. Small mammals were more abundant in "mixed" habitat than the pine habitat (Table 5).

Medium sized mammals recorded in "mixed" habitat include an occasional gray squirrel and white-tailed deer. Four opossum and one raccoon were livetrapped along upper Frees Creek.

The northern two thirds of Frees Creek flows through

D-12

habitat that includes all four major types, but with a dominance of "mixed" and deciduous woodlands. Openings created along the creek by highway intrusion or farming activity, or tree windfalls exhibit a fairly lush growth of shrubs, vines, and some herbaceous vegetation. This narrow band of habitat along the creek represents the best qualtiy habitat for mammals and birds. Its distribution, however, is limited.

#### Deciduous Woodlands

Deciduous woodlands are distributed primarily along the flood plain of the Broad River and its tributaries. These woodlands are typically composed of mature, dense stands that restrict the light penetration which inhibits the growth of understory vegetation.

One study site was established among hardwoods on a tributary of Frees Creek. The stand was not described by the point-centered quarter method, but the frequency of understory vegetation was obtained within the stand (Table 3). Herbaceous vegetation is almost absent while woody plants were present but not abundant. Walter's smilax was the most frequently occurring understory species in this hardwood stand. The understory of hardwood forest along the bottomlands of the Broad River was often limited to sedge and bamboo. Woody plants in the understory were generally absent except where light reaches the substrate along the stream banks and in manmade openings are not common in the deciduous woodlands along the Broad River in the project area.

The deciduous forests in the bottomlands along the Broad River and tributaries will not support many whitetailed deer, turkey, bobwhite, and squirrel. Although the mature trees produce an annual mast crop (acrons, seed, et.), the mast is generally available to turkey and squirrel, but not readily available to white-tailed deer. Browse and forage for deer is not abundant either as indicated by the low abundance and diversity of woody and herbaceous vegetation. Understory vegetation increases abruptly in openings created by abandoned farm fields, railroad and transmission line rights-of-way, and abandoned roads. These openings do not contribute sufficiently to the wildlife cover to warrant the classification of the Broad River bottomlands as productive wildlife habitat.

#### Grasslands

The grassland community type included seven percent cultivated or pasture and five percent abandoned farmland. Abandoned farmland included communities representing several seral stages of succession.

The study site consisted of plantation pine approximately three years after planting with no tree having a の一位の方法の目的にはないため

d.b.h. grater than 2.5 cm. Vegetation on the site typifies an early successional stage of a disturbed site. Broomsedge was the most important grass species on the site (Table 7) with triple-awned grass being the next most important. The density of grass species (6,756 plants/ha) contributed to a total ground cover of 9.8 percent.

Grasslands provide an important link in the requirements of wildlife on the project area. The quality of grasslands to support wildlife is variable according to the current land-uses. Grazed pasture and cultivated fields are important to the few mourning dove and bobwhite. Abandoned farmland in various stages of succession are important to such game species as bobwhite, mourning dove, turkey, white-tailed deer, and cottontail rabbit.

Mourning dove call counts conducted on the project area during the same period that the national surveys are conducted showed the population to be low on the project area. An average of 7.5 doves were heard per route on the project area in 1973 as compared to an average of 49 doves heard per route in 1970 on the best region of South Carolina, the Carolina Sandhills National Wildlife Refuge. Small grain cultivation is important to this game bird, and not abundant on the project area. Song birds were most abundant in the abandoned fields studied on the project area (Table 4). The highest diversity and often the highest abundance of small mammals was collected in a grassland (Table 5).

The distribution of abandoned farmland is another limitation on the carrying capacity for native wildlife species on the project area.

The ecotone that forms between grassland and forest land also is important in the distribution of wildlife. The edge provides nesting sites for many song birds, as well as a diversity of plants for cover and food for bobwhite quail, turkey, white-tailed deer, and cottontail rabbit.

## Summary

The overall quality of the environs on the project area is low. Mixed habitat of pine and deciduous trees is the best quality because of an uneven aged stand of timber. The broad age distribution increases the probability of shrubs and herbaceous vegetation growing near the ground. The mature trees of the deciduous forests and the dense stand in pine plantations retard the development of understory vegetation important to woodland wildlife. A few, but insufficient, openings occur among the deciduous forests and pine forests where understory vegetation is present and encourages some fauna development. The overall quality of the habitat to support wildlife will improve slightly as a result of lumbering operations. Timber cutting activities throughout the region are increasing forest openings. Understory woody and herbaceous vegetation will increase under these openings and an increase in the carrying capacity of the project area for wildlife is anticipated. Table 1

Relative frequencies, densities, dominance and importance values of tree species (2.5 cm or greater dbh) growing in Site 1A of the Broad River Study Area, June 1971.

Species	Relative Frequency	Relative Density	Relative Dominance	Importance Value			
Loblolly Pine	52.9	69.4	80.8	203.1			
Sweet Gum	21.4	18.0	13.9	53.3			
Flowering Dogwood	11.4	6.3	2.7	20.4			
Eastern Red Cedar	7.1	3.1	1.5	11.7			
Tulip Free	2.9	1.3	.6	4.8			
Hop-hornbeam	2.9	1.3	. 4	4.6			
Red Maple	1.4	0.6	.2	2.2			
Totals	100.0	100.0	100.1	300.1			
		-					

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Table 2

Relative frequencies, densities, dominance and importance values of tree species (2.5 cm or greater dbh) growing in Site 4 of the Broad River Study Area, June 1971.

Species	Relative Frequency	Relative Density	Relative Dominance	Importance Value
Loblolly Pine	60.7	81.3	85.9	227.9
Eastern Red Cedar	12.2	6.3	5.1	23.6
Holly	6.1	3.1	1.5	10.7
Black Cherry	4.5	2.5	2.4	9.4
Oak sp. l	4.5	1.9	1.8	8.2
Red Maple	4.5	1.9	0.9	7.3
White Oak	1.5	0.6	0.9	3.0
Hop-hornbeam	1.5	0.6	0.6	2.7
Oak sp. 2	1.5	0.6	0.3	2.4
Willow Oak	1.5	0.6	0.3	2.4
Sweet Gum	1.5	0.6	0.3	2.4
Totals	100.0	100.0	100.0	300.0

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Table 3

Frequency of occurrence (%) of understory, herbaceous, and woody plant species growing within pine, hardwood, mixed pinehardwood, and grassland environs in the Broad River Study Area.

	COLLECTION	SITES	
l Pine l'H W	1B 2 ard- Grass- ood land	3A Mixed	4 Pine 2
-			
4		10	<b>–</b>
		•	•
· <b>-</b>	- 10	10	-
	- 10	-	10
-		-	15
	8 –	5	· · · · · · · · · · · · · · · · · · ·
. —	- 5	, , , ,	-
28		-	-
12	- 20	· · ·	5
-	<b>-</b> -	20	-
-	- 5	-	10
-		· <b>–</b>	5
. 4		. –	-
	tes es	20	—
20	`	_	
•		•	
· <b>–</b>		35	
24	r in	. <b>–</b>	<del>_</del> * *
-	- 65	-	40
, <del>-</del>	- 10	-	-
	l Pine l H w 4 - - - 28 12 - - - 28 12 - - - 28 12 - - - 20 - 24 -	$ \begin{array}{c cccc} \hline COLLECTION \\ \hline 1 & 1B & 2 \\ Pine 1 Hard- & Grass- wood & land \\ \hline 4 & - & - \\ \hline - & - & 10 \\ \hline - & - & 5 \\ \hline 28 & - & - \\ \hline - & - & 5 \\ \hline 28 & - & - \\ \hline 12 & - & 20 \\ \hline - & - & 5 \\ \hline 28 & - & - \\ \hline 12 & - & 20 \\ \hline - & - & 5 \\ \hline 28 & - & - \\ \hline - & - & 5 \\ \hline 28 & - & - \\ \hline 20 & - & - \\ \hline 20 & - & - \\ \hline - & - & - \\ \hline 20 & - & - \\ \hline - & - & - \\ \hline 21 & - & - \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 5 \\ \hline - & - & - \\ \hline 10 \\ \hline \end{array} $	$\begin{array}{c cccc} \hline COLLECTION SITES \\ \hline 1 & 1B & 2 & 3A \\ Pine l Hard- & Grass- & Mixed \\ wood & land & \\ \hline 4 & - & - & 10 \\ \hline - & - & 10 & 10 \\ \hline - & - & 10 & - \\ \hline - & - & 10 & - \\ \hline - & - & 10 & - \\ \hline - & - & 10 & - \\ \hline - & - & 5 & - \\ \hline - & - & 5 & - \\ \hline 28 & - & - & 5 \\ \hline - & - & 5 & - \\ \hline 28 & - & - & - \\ \hline 12 & - & 20 & - \\ \hline - & - & 5 & - \\ \hline 28 & - & - & - \\ \hline 20 & - & - & 5 \\ \hline - & - & - & 20 \\ \hline - & - & 5 & - \\ \hline - & - & - & 20 \\ \hline - & - & 5 & - \\ \hline - & - & - & 20 \\ \hline 20 & - & - & - \\ \hline - & - & - & 35 \\ \hline 2l_{1} & - & - & - \\ \hline - & - & 65 & - \\ \hline - & - & 10 & - \end{array}$

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Table 3 (Continued)

Growth Form									
Common Name	COLLECTION SITES								
	l Pine l	1B Hard- wood	2 Grass- land	3A Mixed	4 Pine 2				
Cane Bluestem	-	-	4	-					
Indiangrass	-	· <b></b>	-	10	30				
Little Bluestem	-	<b>-</b> .	45	-	30				
Scribner's Panicum	28	<b>-</b> '	30	15	25				
Three-awned Grass	-	-	40		-				
Sedges					•				
Sedge	-	20	-	45	-				
Woody	-	• .			·				
• Shrubs				•					
American Holly	8	16	-	15	15				
Blackberry	28	<b>-</b> .	5	-					
Rose	`4	8	15						
Trees (<5 cm d.b.h.)	· ·	• •		•	•				
American Hornbeam	. <b></b>	4	_	-	<b>-</b>				
Black Cherry	4	:,	-		<b></b>				
Black Oak	• –	8	-	-	<b>-</b> ·				
Dogwood	-	<b>4</b>		-	15				
Eastern Red Cedar	4	· -	-	10	-				
Eawthorn	4	4 -	-	-	• <b>••</b> •				
Laurel Oak	4	28	-	15	10				
Loblolly Pine	40	20	5.	35	25				
Pignut Hickory	<b>er</b> .		-	5	<b>-</b>				

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# Table 3 (Continued)

			COLLECTIO	I SITES	
Common Name	l Pine l	1B Hard- wood	2 Grass- land	3A Mixed	4 Pine 2
Red Maple	-	-	· · · · · · · · · · · · · · · · · · ·	5	_
Sugarberry	<del></del> .	8	-	-	-
Sweet Gum	8	4	_	5	-
Water Oak	4	8	-	5	5
.White Ash	-	· •••	-	5	-
Winged Elm	- 12	20	_	15	-
ines.	•	• •		•••	
Honeysuckle	72	16	25	- •	-
Walter's Smilax	4	52	<b>~</b>	50	15

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Season .	Pine			Grass	land <sup>1</sup>	Mixed <sup>2</sup>		
Number of Birds <sup>3</sup>		Spr	Sum	Spr	Sum	Spr	Sum	
		 	· •		· · •			
Hawks	8	Ţ	• 0	. U	0.	2	0	
Bobwnite	•	0	0	2	<u> </u>	Ь	0	
Mourning Doves	-	0	0.	Ō	1	0	0	
Woodpeckers		<u> </u>	0	1.	0	2	2	
Flycetchers		0	2	0	- 4	0	8	
Swallows		0	2	· <b>O</b>	L	· 0 <sup>-</sup>	0	
Blue Jav	•	<b>1</b>	5	0	.1	0	1	
Brown-headed nuthatch		2	ō.	0.	· 0	. 0	0	
Carolina Wren		Ĩ	Ō	Ō	· 0	6	Õ.	
Thmishes		3	2	Ō	Ō	3	2	
Kingleta .	۰.	. 2	ō	0 ·	õ	1 N N	ō	
Varhlang		. 6	18	0.	า้ร	12	· .	
Footam Moodarlank		ñ	0	22		<b>0</b>	ň	
Lastern neadowiana		Ň	2	· 22		- U -	. U	
Carcinal	-		• • •		. U	<u> </u>	<u> </u>	
PDSIIONS		У·	<b>O</b>	10	לד	۰ و۲	U	
Total Species	•	17	15	8	20	17	10	

Tables 4-A summary of birds recorded during strip censuses in three habitats.

<sup>1</sup>Birds of two grassland communities were censused and combined to form this summary.

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63

<sup>2</sup>Mixed refers to a mixture of pine and deciduous leaved trees.

92

<sup>3</sup>A selected list of the total species counted.

40 hectares

			•			· · ·	•	•	• •		•					
Table	5	Rolativo	abundance	of	emall	mammals	collected	along	traplines	in	Study	Sites	14,	2,	3A,	and 4.
			•				•									

Study Site Animal	<u>6/71 S</u> Total No. Caught	urvey Trap- nights/ Animal*	<u>    9/71</u> Total No. Caught	L Survey Trap- nights/ t Animal*	1/72 Tota No. Caug	<u>Surve</u> I. Tra nigh tht Anir	r ap- nts/ mal*	<u>3/7</u> Tot No Cau	2 Survey al Trap o. nights/ ght Animal*		<b>8</b> 44-444-4444 8-444-444-444 8-444-444-444-
Site 1A (Pine) Sotal Traprights Cotton mouse Site 2 (Gravaland)	<u>3</u>	<u>00</u> 150	0	360	0	<u> 240</u>		2	240 120		
Total trapnighte	2	40 10	<del></del>	360		240	100		240	•	•
Cotton Rat	2	120	5	00 11 ·	-2		120	0			•.
	4	00	י ז ז	360	2		80	รัฐ	80	•	
(otton house (ottontoil mabbig	0		· · ·	180	0			2	00		
Barroat rouge	0 0		Ő	100	า่	•	210	า ว	80		
Site 3A (Mixed)	<b>.</b>		<b>v</b>	·	- <b>4</b> -		240	· ·	*		
Total Transights	2	10		360		270			210	· .	
Shortail shrew	1	240	/ 1	90	3		80	1	240		
Cotton mouse	· 4	60 ./	5	72	õ			3	80		Å
Cotton rat	0		Õ		0			ĩ	21,0	<b>N</b> .	24
Site h (Pine)	• .	· · .	· ·							•	Ŧ
Total Traphights	18	30	· · · ·	360		240			240		•
. Cotton mouso	3	6.0	4	90	1	· · ·	240	1	240	•	
Golden mouse	2	90	1	360	0		-	0			
Shortteil shrew	0		1	360	0			0	. * ******	•	• • •
Pine volu	0		0		1		240	0			
		. •	•	•			Ŧ		q •	• •	

\* Trapndghts per animal caught.
Table 6

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Relative Frequencies, densities, dominance and importance values of tree species (2.5 cm or greater dbh) growing in Site 3A of the Broad River Study Area, June 1971.

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-		·· · · · · · · · · · · · · · · · · · ·			·
Species	· .	Relative Frequency	Relative Density	Relative Dominance	I-porta Value
Loblolly Pine		16,0	18.6	21.7	56.3
Eastern Red Cedar	•	16.0	19.2	13.0	48.2
Red Maple	•	13.4	14.8	13.5	41.7
Ash	•	8.4	6.2	9.2	23.8
Hop-hombeam		7.6	5.6	6.8	20.0
Oak sp. 1	· .	7.6	6.2	5.4	19.2
Shegbark hickory	· • •	5.9	4.7	6.0	16.6
Hickory sp.	• •	5.0	4.7	4.3	14.0
Oak sp. 2	•	3.4	3.8	4.6	11.8
Oak sp. 3.	• •	4.2	3.1	4.1	11.4
Ironwood	•	2.5	4.7	3.3	10.5
Basswood	•	3.4	3.8	3.3	10.5
Live Oak	•	2.5	1.8	3.0	7.3
Flowering Dogwood	• •	1.7	1.2	0.5	3.4
Redbud.	•	1.7	1.2	0.5	3.4
Willow Oak	• .	0.7	0.6	_0.8	_2.1
. •	Totals	100.0	100.2	100.0	300.2

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Table 7

Relative frequency, density, and dominance of the various grass species within a pine plantation in the Broad River Study Area.

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Species	Relative Frequency	Relative . Density .	Relative Dominance	Importance Value X
Broomsedge	34.1	38.7	61.3	134.1
Triple-awned Grass	31.7	27.5	14.7	73.9
Little Bluesten	22.0	23.7	16.6	62.3
Witchgrass	7:3	6.3	. 3.5	17.1
Brownseed .	4.9	3.7	3.9	12.5
Totals	100.0	99.9	100.0	299.9

\* Importance value is the sum of relative density, relative dominance, and relative frequency.

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Appendix E

APPENDIX E. Conclusions and Recommendations from the Relationship Between Substrate Content, Water Quality Actinomycetes, and Musty Odors in the Broad River Basin. Environmental Protection Agency, 1973.

The musty odors found in the Columbia, South Carolina, municipal water supply are not unique to that area, but a widespread phenomenon in the Broad River Basin. Actinomycetes, common throughout the basin, are the organisms producing the musty odors; however, actinomycete growth and musty odor production appear to be dependent on the influx and storage of organic matter and other nutrients, air and water temperature, rainfall, and stream flow during the spring season. The major tributaries in South Carolina appear to be a primary source of organic matter and other nutrients, while the canals and reservoirs act as a "sink" for these nutrients, thus providing a substrate conducive to actinomycete growth and odor production.

Columbia water treatment plant personnel should create an odor panel and regularly sample upstream in the vicinity of Parr Dam for odors during the spring of the year. Personnel should be prepared to treat the water with activated carbon when air temperatures and water temperatures of 17°C or greater occur during extended spring-time low-flow (less than 6,500 cfs) periods (2 to 5 weeks) and upstream threshold odors are 4 or greater. When the above conditions occur, severe odor problems can be expected; therefore, treatment should begin as soon possible.

Inputs of wastes from municipalities and industries in the Broad River Basin should be reduced to levels commensurate with available waste treatment technology. Particular attention should be given to wastes from Lockhardt and Carlisle textile mills and discharges into tributary streams draining the Greenville-Spartanburg area.

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## Appendix F

CONCLUSIONS FROM PROGRESS REPORT NO. 2, PARR HYDROELECTRIC PROJECT, BY ALDEN RESEARCH LABORATORIES, JUNE 1973, FOR SOUTH CAROLINA ELECTRIC AND GAS COMPANY

The main conclusions drawn to date from the model studies are:

- (1) The overall concept of the Parr Hydroelectric Project was feasible.
- (2) The daily average water temperature rise at the discharge of the pumped storage plant into the Broad River (Parr Reservoir) was less than the 3F criteria established by the state of South Carolina. This is true for all model tests conducted to date which includes 2 unit (nuclear plant) tests with ambient water temperatures of 45F and 60F and 1 unit (nuclear plant) tests with ambient water temperatures of 45F and 60F.

The maximum water temperature rise at the discharge of the pumped storage plant into the Parr Reservoir was 4F for one nuclear unit operating continuously at full load (see Test No. 70, Fig. 24). The average daily temperature rise for this test was 1.3.

- (3) The average surface temperature rises in the Monticello Impoundment and Parr Reservoir were greater with tests conducted with the colder ambient water temperatures since the heat transfer to the atmosphere was less with the colder ambients.
- (4) The average daily temperature rise at the discharge of the Parr Hydro plant was less than the state of South Carolina criteria of 5F except when the Broad River flow was 860 cfs for more than 7 continuous days at the same time that the ambient water temperature was 45F. The model tests were conducted with 24 hour a day operation of the Parr Steam plant located immediately upstream of the hydro plant. Normal operation of this plant would only be for 8 hours daily.



## Appendix G

## LETTERS OF COMMENT ON DEIS

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UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE Washington, D.C. 20250

RECEIVE

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Jin 15 8 20 AN TH ~FCRETARY'S UFFICE Honorable Kenneth F. Plumb Secretary, Federal Power Commission Washington, D.C. 20426

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6200-11 (1.69)

Dear Mr. Plumb:

E.

Please refer to your letter of September 7, 1973, on Part Project No. 1894 - South Carolina, South Carolina Electric and Gas Company.

We have reviewed the Draft Environmental Impact Statement for the subject project. We have the following comments.

Description of the Proposed Action

Page 1-7, Figure 1-1

Project boundary line is not defined for most of the project area.

Page 1-37, Last Paragraph

South Carolina Electric and Gas Company's (licensee) Exhibit R makes no mention of a swimming area in the Monticello subimpoundment. Monticello Reservoir will have Class B water and will be unsuitable for swimming under existing State water quality criteria.

Page 1-38, First Paragraph

This Draft Environmental Statement states that "no bank fishing." primitive camping on islands or water contact sports would be allowed on the main body of Monticello reservoir, due to restrictions by the South Carolina Pollution Control Authority." However, frequent reference is made to the recreational value of fishing, and particularly of primitive camping on islands.

Description of Existing Environment

Page 2-27, Second Paragraph

The statement that no known rare or endangered species occur within the project area is inaccurate. The presence of Southern Bald Eagles in the project area has been confirmed.

#### Environmental Impact of the Proposed Action

Page 3-5, First Paragraph

The licensee with the assistance of U.S. Geological Survey, is recalculating the area to be inundated by redeveloping Farr Reservoir. The new National Forest area to be inundated will be approximately 300 acres.

Page 3-5 Second Paragraph

The Southern Bald Eagle does occur within the project area.

#### Fish and Wildlife

Aside from the immediate effects of losing considerable acreage of prime wildlife habitat through inundation, there are several long term ramifications which require consideration. Based on ecological phenomena occuring at the Atomic Energy Commission's Savannah River Plant, the following may be pertinent:

No reference is made on chemical analysis for mercury in the environmental report. Since the facility will be using water from the Broad River any mercury present (now or later) may be concentrated in the Parr and Monticello impoundments. Since this element is readily degreded to the methyl form which is assimilated and concentrated in animal flesh, a potential hazard exists.

The licensee cites developments at Par Pond as indicators of thriving game fish population in a cooling reservoir. The fish in Par Pond at the Savannah River Plant exhibit high concentrations of methyl mercury compounds. These compounds resulted in part from continued evaporation of Savannah River water.

Other heavy metals also affect plant and animal life in an aquatic environment. The lower forms of aquatic life (plankton) are extremely sensitive to chromium, regardless of valence. Lead concentrations are moderately high and may hinder survival of smaller fish and plankton. South Carolina Pollution Control Authority sampled the Broad River at Parr (Route 213) for heavy metals on December 8, 1971. The results are as follows:

Chromium	1.09 mg/L	
Copper	Not detectable	
Cadmium	Not detectable	
Lead	34 mg/L	
Total Mercury	0.06 mg/L	

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#### Data from the Sandhill's Experiment Station indicates an open water evaporation loss averaging 45 inches/year. (Approximately 3 3/4 ft.)

Monticello Rearvoir will lose about 25,200 acre-feet of water annually. Parr Reservoir will lose about 16,100 acre-feet annually. This is 6.3 percent of the volume of Monticello Reservoir and 50 percent of the volume of Parr Reservoir. The Reservoirs, Monticello in particular, will become repositories for heavy metals. Monticello Reservoir will accumulate about 4.2 lbs. of mercury, 2,310 lbs. of lead, and 37 tons of chromium annually. Accumulations in Parr Reservoir will be about 60 percent of those in Monticello Reservoir.

Radionuclides released into waterways will be accumulated in vegetation growing along these areas. Will these controlled (through dilution) releases remain benign, or will the effects be passed on to the animal consumers in the local ecosystem -- and ultimately to man, through deer, turkey, and waterfowl?

#### Page 3-34, Second Paragraph

What sort of provisions have been made to dispose of recreationgenerated wastes, particularly those wastes associated with primitive camping on islands?

Page 3-39

The statement makes no mention of the probability of fogs from Monticello Reservoir obscuring Routes 215 and 99. These fogs will be a permanent impact and will create a traffic hazard. The licensee's environmental report discusses the problem but fails to mention any reasonable solutions.

#### Relationship between local and short-term environmental uses and maintenance and enhancement of long-term productivity

The Draft Environmental Statement defines short term environmental use as 40 years, the operating period of the nuclear plant as 40 years and the operating life of the complex as an indefinite time. It also identifies as short-term uses of the environment items as project structures (including the Frees Creek Dam and penstocks), and the creation of a man made impoundment.

However, page 2.6-2 more appropriately identifies the flooding of the Forest land and the loss of associated wildlife habitat as an irretrievable commitment of resources.

The Draft Environmental Statement on page 2.5-2 mentions contribution to "long-term" productivity of the community from the project and an enhancement of long-term productivity of the land and water resources in the site area. We fail to recognize how these benefits will be generated by the project and feel that the analysis should better describe and evaluate them.

#### Alternatives to Proposed Action

Page 8 - 1, 2, & 3

Water losses are stated for the various cooling tower alternatives. These water losses should be compared with the water losses calculated for the proposed project. Fog potential of the proposed project and the non-spray cooling pond alternative should also be discussed.

#### Staff Position on Matters Having Significant Environmental Impact

Section 9.1

Land Use

Page 9-1

1. The Forest Service agrees with the proposed project boundaries for Monticello Reservoir, except to suggest that the entire area within the triangle bounded by State Route 215, relocated Route 99 and County Road 347 should be dedicated to public recreation.

2. The Forest Service is of the opinion that boundaries for Parr Reservoir should not be fixed until recalculation of the inundated area is accomplished. The eastern boundary of Parr Reservoir should be the Southern Railway track, except for places where i undation would go beyond the track. Raising Parr Reservoir will make lands between the railway and the reservoir commercially non-viable because of inundation patterns, ownership patterns, and access.

The Forest Service has recently negotiated a Memorandum of Agreement with the licensee, in which land exchange is a major item. Adjustment of the Parr Project boundary to accomplish this exchange will be in the public interest and will be of benefit to both the project and the Sumter National Forest.

Page 9-4, Last Sentence

Change "...inundate 236 acres of National Forest land" to "300 acres."

Page 9-5

The entire existing Parr Reservoir is a part of the Broad River Waterfowl Management Area. A management plan for that area was made in 1955 by the South Carolina Wildlife and Marine Resource Department, the U. S. Bureau of Sport Fisheries and Wildlife and the U. S. Forest Service.

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Under that plan, a Greentree Reservoir was being developed when the Parr Project was made public. Development was suspended until after the Parr Project was in operation. The Memorandum of Agreement between the Forest Service and the licensee provides for replanning the Broad River Waterfowl Management Unit.

#### Page 9-7

The first 13 lines are repeated from the preceding page.

Sincerely,

Deputy Chief

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DEPARTMENT OF THE ARMY OFFICE OF THE CHIEF OF ENGINEERS WASHINGTON, D.C. 20314

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ATTENTION OF: DAEN-CWE-Y

19 October 1973

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Honorable John N. Nassikas Chairman, Federal Power Commission Washington, D. C. 20426

Dear Mr. Chairman:

This is in reply to the Commission's letter dated 7 September 1973 requesting comments on the Draft Environmental Statement prepared by the Commission's staff in connection with the application filed by South Carolina Electric & Gas Company for new license for Parr Project No. 1894.

Parr Project No. 1894 is located on the Broad River in South Carolina. The applicant seeks, as part of the new license application, authorization to redevelop the existing Parr project to include pumped storage facilities with ultimate dependable capacity of 480 megawatts. In addition, the applicant proposes to use the upper pool of the proposed pumped storage development as a cooling impoundment for the planned Virgil C. Summer nuclear station.

The Draft Environmental Statement for the applicant's project and its proposed redevelopment is generally adequate as related to the Corps of Engineers responsibilities with respect to navigation and flood control. It is assumed that the views of the agencies responsible for other environmental aspects will be a matter of record.

As requested, ten copies of this letter are being sent to the Council on Environmental Quality.

Sincerely yours, LTC, Corps of Engineers ssistant Director of Civil Works, Environmental Programs





G-9

Mr. Kenneth F. Plumb Secretary U.S. Federal Power Commission Washington, D. C. 20426



Dear Mr. Plumb:

The Department of Commerce has reviewed the draft environmental impact statement for "Parr Project No. 1894 - South Carolina," which accompanied your letter of September 7, 1973, (reference my letter of October 18, 1973) and we offer the following comments.

Although this project is located in inland South Carolina and is unlikely to greatly affect estuarine and marine fishery resources, it could produce adverse effects on anadromous species (e.g., striped bass and blueback herring spawning downstream) due to fluctuating water levels. The agreement between the South Carolina Wildlife and Marine Resources Department and South Carolina Electric and Gas Company should provide the necessary flows for successful spawning of these species. Additionally, we suggest that the final impact statement include studies to monitor the spawning of these fish and the feasibility of altering flows, if necessary, during the spawning seeson.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving a copy of the final statement.

Sincerely,

ohen R Waller Sidney R. Gal

Deputy Assistant Secretary for Environmental Affairs





G-10 DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE REGION IV SO 7TH STREET N.E. ATLANTA, GEORGIA 30523 October 23, 1973

和中国人民的政策的政策

OFFICE OF THE REGIONAL DIRECTOR

Re: 350-9-73

Mr. Kenneth F. Plumb Secretary Federal Power Commission Washington, D. C. 20426

Dear Mr. Plumb:

Subject: Project No. 1894 Parr Hydroelectric Project Parr, South Carolina

We have reviewed the draft Environmental Impact Statement on the above subject project. We note an area of secondary impact which appears not to be fully clarified in your draft EIS.

In Section 3.1, Human Elements, it is estimated that approximately 1,000 school children would result from a combination of the two projects proposed for the area. The draft EIS estimates that approximately 30 percent would be school children of permanent residents employed on the project. This would result in approximately 700 school children of transient workers. As stated in the draft EIS, a majority of the transient workers would reside in the Columbia area. In the event 30 percent resided in the project area, a need of seven classrooms would be required by the Local Education Authority (LEA). The two counties to be affected are rural and appear to have a stable school population. Consequently, we recommend that you consult with the LEA's on the potential impact of additional classrooms on their physical plant facilities.

RECEIVED OCT 3 1 1973 DEVICES OF LIGHTSED PROJECTS

Sincerely yours, POWER COM James Yarbrough Regional Invironmental; Off OCKET SECTIO

#### G-11



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT COLUMBIA AREA OFFICE 1801 MAIN STREET, JEFFERSON SQUARE COLUMBIA, SOUTH CAROLINA 25201

Coctober 17, 1973

IN REPLY REFER TO: 4. 3PP

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Mr. Kenneth F. Plumb Secretary Federal Power Commission Washington, D. C. 20426

Dear Mr. Plumb:

Subject: Draft Environmental Impact Statement Project No. 1894 Parr, South Carolina

The subject document has been reviewed by the staff of our Area Office, and it is our determination that this proposal will have no adverse effects on existing or proposed HUD projects.

We have noted that some relocation will be required; if relocation assistance is desired, please contact the Planning and Relocation Branch in our Area Office.

We appreciate the opportunity to have reviewed this project.

Sincerely, Franklin H. Corley, Jr.

Acting Director



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United States Department of the Interior

G-12

OFFICE OF THE SECRETARY WASHINGTON, D.C. 20240

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P-1894

Dear Mr. Plumb:

Thank you for the letter of September 7, 1973, requesting our views and comments on a draft environmental statement for the Parr Project, FPC No. 1894, located on the Broad River in Fairfield and Newberry Counties, South Carolina.

We have completed our review of the draft statement and submit the following comments for your consideration and use in preparing a final statement for this proposal.

#### General Comments

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We believe the draft statement fails to overcome the major shortcomings of the applicant's environmental report as noted in our letter to you dated June 15, 1973. In particular, the draft statement offers superficial and misleading discussions on the fish and wildlife resources and. the project's impact on these resources. The applicant has proposed various biological studies for identification of the fish and wildlife resources and environmentally desirable project modifications. However, there is no evidence to indicate that the details of these proposals have been finalized or reviewed by the appropriate State and Federal agencies. The intent to carry out such studies is laudable but it does little to aid the draft statement in describing the fish and wildlife resources in the study area or identifying the project's impact on these resources. Accordingly, from a fish and wildlife standpoint, the statement will be deficient in its environmental assessment of these resources and in developing any meaningful measures to mitigate any adverse impacts of the project on the resources.

The draft statement appears to be less than satisfactory in discussing the available alternatives to the proposed project and in describing the environmental impacts of the alternatives. The proposed project will cause some significant losses wildlife habitat and has a potential to adversely affect the

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Let's Clean Up America For Our 200th Birth

fishery populations in the Broad River system. For this reason, we urge full consideration of all reasonable alternatives and an impact assessment for each alternative.

From a recreation standpoint, we find it difficult to assess the environmental effects of this proposal. This problem stems from the lack of an acceptable Exhibit R. We urge the Commission to require the applicant to develop an acceptable Exhibit R as soon as possible and hopefully before the final statement is developed for this project. The inadequacies in the present Exhibit R are set forth in cur letter to you dated June 15, 1973.

The following comments will be directed to specific sections of the draft statement.

#### Description of the Existing Resources

2.2 Geology and Physical Features - Sand and gravel has been dredged from the Broad River and granite has been quarried near the project. The Monticello Reservoir is underlain by the Abbeville-York zone which extends across the State; this zone contains several mineral commodities other than granite which have been mined in the past in places outside the project area.

There is a slight chance that the granite quarry at Blair, on Rocky Creek (Blair Quadrangle, South Carolina), may be affected by the 9-foot rise of the Blair River. This possibility is currently being investigated by the South Carolina Electric & Gas Company. This potential impact should be determined and expressed in the environmental statement.

The supply of sand and gravel and granite in the region is such that the commitment of these resources to the project would be relatively minor. There are no other known mineral commodities which would be affected by this project.

The fact that the upper reservoir would be used as a source of cooling water for a nuclear powerplant has raised questions regarding the integrity of the embankments and related subjects. These have been expressed in a letter of January 4, 1973, from H. W. Coulter, Geological Survey, to W. P. Gammill of the Atomic Energy Commission. Concerns expressed at that time centered around the following items: (1) transmissivity of geologic materials beneath the dams impounding the upper reservoir and implications of seeps and springs below one or more of the dams; (2) analyses of embankment deformation and the limit of settlement that could be tolerated without danger of internal cracking of the embankments; (3) dynamic stability of the embankments in relation to local soil conditions; and (4) stability of natural slopes at the construction sites. The above questions are of concern mainly in relation to the availability of cooling water for the nuclear plant. However, if these subjects are not covered in the environmental statement for the present hydroelectric project, assurances should be given that they have been adequately considered either in the environmental statement for the nuclear plant or the safety analysis report for that plant; we suggest reference to the pertinent documentation in the final environmental statement.

2.4 Water Quality - There is no indication in this section that chemical analyses have been made for the detection of heavy metals in the Broad River. Data taken by the South Carolina Pollution Control Authority at Parr (Route 213) on December 8, 1971, revealed the presence of chromium, lead, and mercury at more than trace levels. The potential concentration of these pollutants in Parr Reservoir, Monticello Reservoir, and the recreational subimpoundment and the effects of heavy metal concentrations on the biotic community and recreational potential should be discussed in this section.

This section should also acknowledge the potential increase of sedimentation in Parr Reservoir that will result from the increase of retention time of Broad River waters. It is our understanding that the existing Parr Reservoir has suffered a 75 percent loss of storage capacity because of sedimentation since initial construction. The potential loss of pumped storage capacity and thus project benefits should be adequately discussed in this section.

2.5 Current Land Use - This section should present a detailed discussion of the various vegetative types that occur in the project area, including total acreage and relative distribution of each type within lands to be inundated. The present statement that creation of Monticello Reservoir will inundate about 6,000 acres of pine forested land is misleading. In reality, this site supports about 3,000 acres of bottomland hardwoods and mixed pine-hardwood stands and about .,000 acres of pine plantation.

2.8 Fish and Wildlife - This section of the final statement should identify the quantity and quality of fish and wildlife habitat to be affected by project implementation. In addition, discussions related to existing populations should include the relative abundance and population densities for game and non-game wildlife species indigenous to the project area.

The final statement should recognize white-tailed deer, the most important big game species in South Carolina, as one of the primary game species within the project area. Several years ago, the South Carolina Wildlife and Marine Resources Department expanded their Central Piedmont Game Management Area to include the project area. The excellent habitat in the Parr Reservoir and Frees Creek area is typical of the habitat responsible for the markedly increased populations of deer and turkey in the entire game management area. The abundance of escape cover and herbaceous and woody browse plants within the bottomlands, mast production in the mixed stands, and the interspersion of uneven-aged timber stands are responsible for the maintenance and productivity of these populations.

The statement that several species of ducks, other than wood ducks, have been reported as "transients" in the project area implies the relative unimportance of these species. We point out, however, that the majority of waterfowl in the Broad River area and South Carolina is composed of wintering species that are not permanent residents.

2.9 Existing Recreation - This section should quantify the total consumptive and non-consumptive fish and wildlife oriented recreational use of project lands; in particular, the proposed reservoir sites and transmission line corridors.

The proposed action will not directly affect any existing or proposed unit of the National Park System nor will it affect any registered National Historic, Natural or Environmental Education Landmark or any site now being processed for registration.

2.10 Cultural Resources - We are pleased to note the attention shown to cultural (historic, archeological, architectural) resources in the planning of the project. It is indicated that the applicant will fund archeological investigations in the project area under the guidance of the State Archeologist. However, one can interpret the statement to imply either that a thorough survey and salvage program for the entire area will be conducted, or only that four previously identified sites will be investigated. We believe that only the former course of action would adequately assure full consideration of the integral portion of the environment represented by cultural values. We also wish to point out that, to fully assess the project's effects on cultural values, the survey should cover not only the reservoir area, but lands affected by transmission lines, road construction, borrow pits, and other construction activity. On the basis of such an archeological survey, the full effects of the project on cultural resources can be determined and appropriate steps to avoid or mitigate adverse effects initiated, including salvage excavation. We trust the final statement will clear up this question.

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We are further pleased to note the evidence of compliance with Section 106 of the National Historic Preservation Act, and the close cooperation with the South Carolina State Historic Preservation Officer.

3. Environmental Impact of the Proposed Action - The second paragraph, page 3-1, should be deleted in the final statement. We do not agree that the proposed boat launching ramp with its 10 parking spaces and the recreational subimpoundment will offer unique features in Fairfield County. We do agree that the scenic overlook will provide the first area view of a combination pump storage and cooling impoundment but question the influence of this facility on overall recreational activities. Furthermore, there is no evidence to support the presumption that sport fishery populations will be increased by construction of this project.

3.2 Fish and Wildlife - The inundation of 2,550 acres of bottomlands resulting from the enlargement of Parr Reservoir and about 3,000 acres of bottomlands and mixed pine-hardwoods by construction of Monticello Reservoir will result in significant losses of wildlife habitat and a severe reduction in the carrying capacity of area lands for most native wildlife species. The immediate result of this habitat destruction will be the dispersion of existing populations to adjacent land areas. Contrary to discussions in the draft statement, there is little possibility that many of the displaced wildlife species will be absorbed by the surrounding habitat. It is well documented that bottomland hardwood areas are centers of high energy assimilation and that these areas provide den sites and escape cover for various wildlife species. For example, the best white-tailed deer habitat is characterized by a diversity of vegetative types and age classes such as presently exist at the Parr and Monticello sites.

The bottomland and mixed hardwood sites provide a majority of the foods (particularly winter browse) and escape cover for this species. It is biologically misleading to suggest that destruction of about 6,000 acres of these vegetative types will not severely decrease the area carrying capacity for this species. Stransky (1969)<sup>1</sup>, in a comparison of forest types, reported: (1) there is more and better deer food in bottomlands than on uplands; (2) South Carolina bottomlands support an estimated one deer per 13 acres while loblolly pine-hardwood and longleaf pine support one deer per 30 to 50 acres and 78 acres, respectively. Therefore, bottomlands are three times as valuable as the higher elevation forest types for deer production.

The statement has failed to recognize the affects of this proposal to waterfowl populations in the project area. The destruction of vegetation and the daily water level fluctuations in 2,550 acres of bottomlands adjacent to Parr Reservoir will preclude any significant waterfowl usage. Of particular importance is the potential destruction of valuable nest sites for the wood duck, an important resident waterfowl species. It has long been recognized that the major limiting factor in most wood duck populations is the

IStransky, J. J. 1969 - Deer Habitat Quality of Major Forest Type in the South, Pages 42-45 IN: White-Tailed Deer in the Southern Forest Habitat Proceedings of a Symposium. Sou. Forest Exp. Station F.S. USDA Forest Game Comm. of S.E. Sect. of the Wildlife Soc. and School of Forestry, Stephen F. Austin State University. 130 Pages lack of suitable nest cavities. This section should also recognize the proposed inundation of 235 acres of U.S. Forest Service lands that have been proposed as a waterfowl management area, and the Dawkins Wildlife Management Area that has been managed by the South Carolina Wildlife and Marine Resources Department for about 13 years.

The statement has recognized the importance of the striped bass fishery downstream of the project. However, there are no data to indicate that the downstream flows proposed to be released by the applicant will insure the continued productivity of resident or anadromous fish species. This section should present the results of a hydrological study to indicate the desired flow releases for the maintenance of these downstream fisheries. These data should represent both quantitative and qualitative aspects of flows below Parr Dam.

3.3 Nuclear Station and Monticello Reservoir - We have commented on this aspect of the project in our letter to the Atomic Energy Commission concerning the draft environmental impact statement for the Virgil C. Summer Nuclear Powerplant. Furthermore, we have expressed our concerns about the cumulative operational affects of the pumpedstorage and nuclear facilities in our letter of June 15, 1973, to your agency.

For this reason, we will defer all comments on the proposed nuclear facility until the Alternatives Section (Section 3).

#### 4. <u>Measures to Enhance the Environment or to Avoid or</u> Mitigate Adverse Environmental Effects

4.2 Land Management - This section of the draft should be deleted from the final statement until such time as the applicant and the Federal Power Commission can present detailed and comprehensive discussions of the measures proposed by the section title. It is unreasonable to assume that enumeration of vague biological monitoring programs and fish and wildlife management schemes can be considered as environmental enhancement or mitigation of adverse environmental effects. We suggest that the details of proposed biological studies be finalized and reviewed by the appropriate State and Federal agencies prior to completion of the final statement.

Specifically, the applicant's Land Management, Timber Management, and Wildlife Management Programs are nondescript and will depend on the results of ecological study programs that appear to be nonexistent at present. The statement that recreational facilities and activities compatible with the area needs, normal project operations, and public safety would be developed is totally misleading. The South Carolina Pollution Control Authority has placed restrictions on the use of Monticello Reservoir to exclude bank fishing, primative camping on islands, or water contact Furthermore, the limited project lands around the sports. reservoir sites, the large daily fluctuations in Parr Reservoir, and the exclusion zones around the nuclear and powerhouse facilities will severely limit recreational opportunities at the project site.

4.3 Measures to Mitigate Adverse Effects on Fish and Wildlife - The measures proposed in this section consist largely of the initiation of monitoring programs for use in selecting measures which could minimize any projected adverse effects. However, since it appears that the applicant has not seriously considered alternative project plans, the yet uncompleted studies will be of little value. The results of these baseline studies should be available now to facilitate a comparison of the environmental commitments of all project alternatives.

In view of the continual destruction of wildlife habitat by reservoir inundation, poor agricultural practices, and urban development, we suggest that the applicant consider reducing the size of the proposed reservoirs to that needed for pumped-storage and make-up cooling water. The proposed Impoundment Management Program seems of questionable value in view of the presence of the 50,000-acre Lake Murray less than 15 miles from the Parr Dam.

The applicant has proposed the mitigation measures of minimum flow releases from Parr Dam and the dedication of a 90-acre greentree reservoir site. However, the minimum flow designation cannot be considered mitigation but is instead a project design feature to avoid downstream fishery losses. Moreover, as stated previously, there are no data to suggest that these minimum releases will be sufficient to accomplish the intended purpose. The proposed greentree site has little or no mitigation value for the inundation of 235 acres of U.S. Forest Service lands previously slated for waterfowl management and the destruction of about 9,000 acres of productive wildlife habitat. We suggested various mitigation measures to the applicant and the Federal Power Commission in our June 15, 1973, letter to your agency. These and additional measures should be given utmost consideration in the preparation of the final statement.

5. Unavoidable Adverse Environmental Effects - This section should be revised in view of previous comments. The unavoidable adverse environmental effects of construction and operation of this project will be the destruction of over 9,000 acres of productive wildlife habitat, including the Dawkins Wildlife Management Area and lands in the U. S. Forest Service's Broad River Composite, the inundation of nearly 15 miles of river and stream fish habitat, a reduction in the carrying capacity of existing Parr Reservoir and a possible reduction in productivity of downstream fisheries.

 Relationship Between Local and Short-Term Environmental Uses and Maintenance and Enhancement of Long-Term Productivity - Statements such as long-term benefits in human consideration would be enhanced by the applicant's proposed Land Management Program for project land and water resources are totally unfounded in the absence of details concerning the mentioned programs.

In view of the present potential of project-associated lands to support extensive consumptive and nonconsumptive fish and wildlife-oriented recreational activities, we disagree that project implementation will provide enlarged recreational areas. Furthermore, the last sentence in this section should be deleted until data are presented to support the claim of a long-term improvement in sport fishery resources.

8. Alternatives to the Proposed Action - The National Environmental Policy Act of 1969 requires a ". . . rigorous exploration and objective evaluation of alternative actions that might avoid some or all of the adverse environmental effects. Sufficient analysis of such alternatives and their impact on the environment should accompany the proposed action through the agency review process in order not to foreclose prematurely options which might have less detrimental effects . . . " We trust the alternative section of the final statement will be revised to more fully meet the above requirements of the National Environmental Policy Act.

We suggest that the Commission give serious consideration to the inclusion and environmental assessment of an alternative of reduced reservoir size to that needed for pumpedstorage and make-up cooling water, only. Our calculations indicate that at no time will forced consumptive water losses due to the operation of two 900 MWe Nuclear Units exceed about 65cfs or 130 acre-feet/day. That is, the use of cooling towers for the proposed Virgil Summer Nuclear Powerplant would only require about 130 acre-feet/day of make-up water. Since 29,000 acre-feet of water will be pumped into Monticello Reservoir daily, the size of this reservoir could be reduced to provide only enough storage for peak generation and residual storage for make-up water. Further, a display of the environmental effects of such a proposal may well demonstrate its superiority over the proposed project insofar as fish and wildlife resources are concerned.

It is our opinion that the applicant has various alternatives available for the avoidance or mitigation of adverse environmental effects. For example, the impoundment of Hellers and Cannons Creeks for waterfowl mitigation and the resultant loss of usable storage in Parr Reservoir would result in only a 20 minute loss of generation time during the daily pumpedstorage cycle.

We recognize the need for maximum head development to meet projected peak loads. Maximum head development could be realized by the applicant by location of a smaller upper reservoir dam site at a higher elevation in the Frees Creek Watershed. Further, we suggest that the final statement identify and evaluate another alternative. This alternative is the development of necessary peak load facilities in alternative locations outside the applicant's service area. On page 8-13 of the draft statement, the staff indicated that the most feasible sites studies were located in Duke Power Company's Service Area.

In summary, this Department has serious reservations as to whether the applicant's proposal is the best overall solution. The present proposal has significant adverse impacts on the fish and wildlife resources of the study area, and these concerns were set forth in our letter to you of June 15, 1973, when the applicant's licensing information was reviewed. We also suggested further consideration of an alternative proposal dealing with a smaller sized project and also recommend its inclusion in the alternative section of the environmental statement. Accordingly, we trust the Commission will fully assess the merits of the alternatives to the applicant's proposal when making the licensing decision for the Parr Project.

Sincerely yours, of the Interior rettary

Deputy Assistant

Honorable Kenneth F. Plumb Secretary Federal Power Commission Washington, D. C. 20426



DEPARTMENT OF TRANSPORTATION UNITED STATES COAST GUARD RECEIVED

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FECCE OL POWER COMMISSION MAILING ADDRESS. U.S. COAST CUAPE(G-WS) 400 SEVENTH STREET SW. WASHINGTON, D.C. 2000 PHONE: 426-2262

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Mr. Kenneth F. Plumb Secretary Federal Power Commission Washington, D. C. 20426

Dear Mr. Plumb:

This is in response to your letter of September 7, 1973 addressed to Mr. Benjamin O. Davis, Jr. and concerning the licensing application to utilize the upper pumped storage reservoir of the Parr Hydroelectric Project as a source of cooling water for a nuclear steam-electric plant located in Fairfield County, South Carolina.

The concerned operating administrations and staff of the Department of Transportation have reviewed the material submitted. We have no comments to offer, nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely.

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RICHLAND COUN G-24 DENTRAL REGIONAL PLANNING MIDL ANDS 1125 ELANDING ST UTH CAROLINA EXINGTON COUNTY October 10, 1973 Federal Power Commission Washington, D.C. 20426 PWR-LP Re: Project No. 1894-South Corolina South Carolina Electric & Gas Company Dear Sir: The Draft Environmental Impact Statement, Parr Project, No. 1894-South Carolina, September 1973 has been reviewed by this office. The findings of this report appear reasonable which indicate that the positive impact of this proposed project outweighs the negative implications and that the application . should be approved. Sincerely yours NECEIVE Sidney F. Thomas, Jr. RΞ Executive Director CCT 6 SFT Jr/mas ENTERS OF LOUISED FL Honorable Russell E. Train, Chairman cc: Council on Environmental Quality FEREL Executive Office of the President 722 Jackson Place, N.W. Washington, D.C. 2006 DOCKE



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WADE HAMPTON OFFICE BUILDING P. O. BOX 11280 COLUMBIA, S. C. 29211

WILLIAN L. HARRELSON" CONMISSIONER

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October 24, 1973

Mr. Kenneth F. Plumb Secretary Federal Power Commission Washington, D. C. 20426



Re: PWR-LP Project 1894 S. C. Electric & Gas Co.

Dear Mr. Plumb:

Thank you for the opportunity to review the Draft Environmental Statement on the renewal of the S. C. Electric and Gas Company's Parr Project No. 1894.

This Department has no adverse comment and finds the project consistent with the Department's policies.

THIS PARCHHENT IS HADE FROM COTTON THE PRINCIPAL CROP OF THE SOUTH

Yours very truly,

William L. Harrelson Commissioner of Agriculture

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Mr. Kenneth F. Plumb Secretary Federal Power Commission Washington, D. C. 20426



Dear Mr. Plumb: -

In reference to the Draft Environmental Impact Statement for South Carolina Electric and Gas Company's Project No. 1894, we find that the environmental impact of the proposed project will be negligible upon sites of historical importance.

As stated in the Draft Environmental Impact Statement, the proposed Monticello Reservoir Project will flood some lands belonging to the Davis Plantation near Monticello, the Monticello Methodist Church, and the White Hall African Methodist Episcopal Church. None of these buildings themselves, however, will be flooded or otherwise affected.

This project will also flood the sites of five small cemeteries, but we understand that South Carolina Electric and Gas Company is in the process of locating and contacting the descendants of people buried there.

We have no objections to South Carolina Electric and Gas Company's Parr Project (No. 1894). Thank you for sending us the Draft Environmental Impact Statement.

Sincerely,

Charles E. Lee State Historic Presérvation Officer

CEL:CZF:sa

CC: Mr. E. H. Crews, Jr.

Vice-President Construction, Production Engineering South Carolina Electric and Gas Company Post Office Box 764 Columbia, South Carolina 29202

RECEIVED OCT 1 0 1973 EDERAL POWER COMMISSION



# South Carolina State Commission of Forestry

October 1, 1973

IN R. TILLER

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Federal Power Commission Washington, D. C. 20426

Re:

PWR-LP Project No. 1894- South Carolina South Carolina Electric & Gas Company

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DIVISION OF LICENSED PLOTESTS

BOX 287

BIA. S. C. 25202

#### Gentlemen:

We have reviewed the environmental impact statement of the Parr Project # 1894 as to its effects on forestry. It appears that 8,550 acres will be directly affected through inundation and undoubtedly additional acreage lost for transmission lines later.

There does not seem to be a reasonable alternative for the loss of this land to forest production in exchange for the needed electrical energy. So, we therefore offer no objections or suggestions for this project.

Very truly yours,

John R. Tiller Stade Forester

JRT:sbf

cc: James Addison S. C. Electric & Gas Co. Box 764 Columbia, S. C. 29210



SOUTH CAROLINA STATE HIGHWAY DEPARTMENT DRAWER 191 COLUMBIA, S. C. 29202

October 3, 1973



Mr. Kenneth Plumb Secretary Federal Power Commission Washington, D.C. 20426

> RE: Project No. 1894 - South Carolina South Carolina Electric & Gas Company

Dear Mr. Plumb:

Reference is made to your letter of September 7, 1973, concerning the Draft Environmental Impact Statement on the above referenced project.

We have reviewed the statement and note that several roads and bridges under our jurisdiction would be affected by the proposed project. However, we have no objections to this proposed action by the South Carolina Electric & Gas Company as long as affected roads areadequately relocated and bridges raised to our satisfaction. We understand that engineering studies relative to adjustments in affected roads and bridges are currently underway.

Sincerely yours,

J. D. McMahan, Jr. State Highway Engineer





1991

OFFICE OF THE GOVERNOR

DIVISION OF ECONOMIC OPPORTUNITY

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COLOMSIA, 3: CT 29201

P. O. Box 1520

# State of South Carolina

October 2; 1973

JOHN C.WEST

Mr. Kenneth F. Plumb, Secretary
Federal Power Commission
825 North Capitol Street, N. E.
Washington, D. C. 20426

607 S 1973

SECRETARY'S OFFICE

Re: Project 1894, South Carolina

Dear Mr. Plumb:

We have reviewed in detail the above captioned program at Parr Shoals, South Carolina, submitted by the South Carolina Electric and Gas Company. In addition to our review at the state level, we had the local community action agency Executive Director review this proposal also since it is in his geographical territory.

We feel that this is a necessary program and one which will produce much needed services.

This project has our complete concurrence, and we recommend its approval.

With kind regards, I am

Sincerply yours,

Lee

. State Director

JLS:blm


MARTY CRACKER State of South Carolina Water Resources Commission

RECEIVED Dot 23 11 us 11/13 FENTRAL POWER COMMISSION

Clair P. Guess, Jr. Executive Director

October 19, 1973

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POWER COMM

OCT 23 1973

DOCKET SECTION

Mr. Kenneth F. Plumb Secretary Federal Power Commission ashington, D. C. 20426

REFERENCE: Project No. 1894 - South Carolina South Carolina Electric and Gas Company

Dear Mr. Plumb:

The South Carolina Water Resources Commission has reviewed the Federal Power Commission's Draft Environmental Impact Statement concerned with the application by South Carolina Electric and Gas Company for a new license for the existing Parr Project No. 1894. Parr Project No. 1894 is to be redeveloped to include a pumped-storage project and use of the upper pumped-storage reservoir as condenser cooling water for the Virgil C. Summer Nuclear Station Unit No. 1 and a proposed Unit No. 2.

When the staff of the South Carolina Water Resources Commission initially reviewed the Draft Environmental Impact Statement prepared by the Atomic Energy Commission for the Virgil C. Summer Nuclear Station Unit No. 1, we considered the <u>total</u> project which consists of both the V. C. Summer Station and the redevelopment of Parr Project No. 1894. At that time we offered no objections to the project and that position stands today. We feel that the total project will have less environmental effects than the alternatives and urge the issuance of a construction permit by the Federal Power Commission for their portion of the proposed development.

The South Carolina Water Resources Commission appreciates the opportunity to comment on this Draft Statement and offers any assistance we might provide.

Sincerely yours,

Clair P. Guess, Jr. Executive Director



10 Copies furnished Council on Environmental Quality

EPA Enviror	The d-se state coalition
P.O. BOX 5761 C	OTUMBIA SOUTH CAROLINA 29250
Mr. Kenneth F. Flumb, Secretar, Federal Fower Commission	
Masnington, J.J. 20420	CENTRAL FILES
pear J11;	

Please accept the following comments of the South Carolina Environmental Coalition with respect to the Draft Environmental Impact Statement for Project No. 1894-South Carolina, F.R-LP, the Paar Project of the South Carolina Electric and Gas Company.

We are aware that the comments on the Draft statement were requested to be submitted on October 23; It was originally not our intention to comment but a re-examination of the water quality portions of the Draft based on information we only this week received has raised new concern in our mind about the adequacy of the Draft statement. The South Carolina Environmental Coalition is a statewide citizens group. We hope that our comments will aid in your evaluation of the Draft Environmental Impact Statement and will lead to further study of water quality factors at the project site.

On October 25, 1973 we received in the mail at our request a report entitled <u>The Relationship between Substrate Content</u>, <u>Mater Quality, Actinorycetes</u>, <u>and Musty Coors in the Broad River Basin</u>, deted Content, 1973, weitten by the Environmental Protocolion Agency, Surveillance and Analysis Division, Athens, Georgia. This report is <u>not</u> referred to in the References of the Draft Environmental Impact Statement for the Faar Project.

The report by EPA was prepared because of reports of nusty odors in the drinking water system of the city of Columbia (the state capital and one of the state's largest cities). Columbia receives its drinking water system's supply from the Broad River six to eight hours flow time downstream from the Faar Reservoir site. However, the Draft Environmental Impact Statement does not mention that Columbia takes its water from the Broad, nor does the Draft describe water quality problems of the river in relation to the musty odor problems of Columbia. Cur concern is that the musty odor of water that the city of Columbia depends upon is directly related to the proposed Faar Project, and that inadequate consideration of this crucial environmental factor is provided in the Draft.

The report by ZPA suggests that the odor problems of the drinking water of Columbia may be attributed to algal and fungal organisms, and cites numerous studies showing the relationship of actinomycetes to odor problems in water. The EFA report (page 36) further states that as temperature increases, the activity of actinomycetes is enhanced. At the Paar Project and at the canals of the intake system at Columbia, (page 37), the EFA report notes a "sink" effect that may create "culture-like" conditions for actinomycetes. The proposed Paar Project would create a greatly enlarged sink, much of which would be warmed by use as cooling water for the Virgil C. Summer nuclear station; conditions might become almost ideal for contamination of the Broad River's waters with an odor problem. However, the Braft statement does not analyze the potential problem and ignores existing data on the subject. Clearly, the odor problem of the Columbia water system is an environmental problem of the utmost concern and is directly related to the Faar Project. Therough, independent studies should be conducted before a Final Invironmental Impact Statement is released. Her can the public place any confidence in the assertions such as those in the Draft that analysis of water quality at the project will be made during operation, as on page 4-15. Rather, providing for cooling towers, wastly reduced reservoir size below that which is proposed, and nore stringent regulation of discharge rates from the impoundments are positive and feasible alternatives to the existing proposal and should be fully explored before approval of the project or its Environmental Impact Statements.

We are also concerned with losses to fisheries, recreation, and wildlife in the proposed project and we are hopeful that conments of others will be made on those areas of concern. We understand that some environmental damage may be necessary for the production of energy needed by society, but we are hopeful the convents we have made will help to minimize the risks. The suitability of water to be drunk by tens of thousands of persons is, however, of paramount importance and well worth the time and expense further study of the Paar proposal would require. Respectfully yours. KNLID Ann R. Jennings Fresident

Brin Blankenelde

Director



- . MODIFICATIONS SCENS FEELS SHOULD BE MADE IN THE TEXT:
  - Page 1-2, line 9: <u>90 MM</u> should be changed to <u>900 MM</u>. (900 MM is the correct capacity of one unit of the V. C. Summer Nuclear Station).
  - 2. Page 1-38, line 12: <u>4115 cores</u> should be changed to <u>4400 acres</u>. (Correct value obtained from Figure 1-9, page 1-41 of text).
  - 3. Page 1-38, line 14: The phrase <u>slichtly rore than 800 acres</u> should be changed to <u>about 1400 acres</u>. (Correct value obtained from Figure 1-9, page 1-41 of text.
  - 4. Page 1-38, line 15: 800 acre-feet should be changed to 2500 acrefeet. (Correct value obtained from Figure 1-9, page 1-41 of text).
  - -5. Page 1-54, line 15: 100 feet should be changed to <u>approximately</u> <u>200 feet</u>. (200 feet is the figure given in Exhibit R of SCELG's amended application for new license for Project No. 1894, filed with the Commission on July 26, 1972.
  - 6. Page 1-59, line 8: The words <u>South Caroline Route 34 and should be</u> removed. (This road will not be affected by the raising of Parr Reservoir).
  - 7. Page 1-60, line 5: This line should be changed to read "...zation to use the 300 acre Monticello subimpoundment for swimming, after filling."

It is not presently proposed to use the lower part of Monticello Reservoir for swimming or other water contact activity, just the sub-impoundment. This is consistent with the requirements of the state of South Carolina as stated in the third paragraph of page R-1 of Exhibit R included as Appendix F of the applicant's Appendicies to the Environmental Report-Parr Hydroelectric Project, FPC Project 1894, filed with the Commission July 25, 1972; and in the Amended Application for New License for Parr Hydroelectric Project, FPC Project 1894 (Exhibit R - Page R-1, third paragraph), also filed on July 26, 1972.).

- Page 1-60, bottom line: The words <u>White Mall Methodist Church</u> should be deleted from this sentence. (The June 1, 1972 letter from the S. C. Department of Archives & History does not include this item). We also point out to the Commission's attention that Fonti Flore is not included on the map of historical sites on page 2-29, or in the text on page 2-30.
- Page 2-12 (Table 2-2, Cont'd.). The source of this table is not SCE2G's Environmental Report for Project 1894, filed on July 25, 1972. The Commission apparently obtained this table from another source and it appears that the other source was Appendix A-1, page 27, of the Supplement 1 of the Environmental Report for the Virgil C.

1. T. C. T. C. T.

CENG FEELS SHOULD BE LUTE IN THE TEXT: ...(CONT'D.) CCT LO .r Nuclear Station, Unit I.

age 2-28, line 23: The word Eviscopel should be deleted. (This church is listed by the S. C. Department of Archives and History as the Monticello Methodist Church, and is located on S. C. Route 215 immediately north of the Davis Plantation and near the Town of Monticello).

- 11. Page 3-3, line 19: The words <u>Scith Carolina Route 34 and should</u> be deleted. (This road will not be affected by the raising of Parr Reservoir).
- Page 4-11, line 20: Proposed should be changed to initial. (The sampling began in 1971).
- Page 4-11, line 21: This line should be changed to read "...4-1. Certain sampling points have been and may be relocated to conform with...". (Since the sampling is already in progress, some changes have been made).
- 14. Page 4-16, line 18: The word <u>turbidity</u> should be deleted and replaced with <u>stream flow</u>. (Due to the lack of proper instrumentation to adequately monitor turbidity, as well as heavy metals; on a continuous basis, we recommend that these measurements be determined by grab samples taken at monthly intervals, and at a time that would coincide with approximately the 14,500 acre-feat release point from Monticello Reservoir.) These changes should be reflected in Table 4-2, page 4-18.
- 15. Page 9-8, line 6 and ff: Should be changed to read "within one year following commercial operation of the project".

This modification is requested by the applicant due to the fact that low flat areas appropriate for development as green tree reservoirs can be positively identified after operation of the project has begun.\_

> The applicant requests the Commission to note in the attached memorandum of understanding with the U.S. Forest Service, page 3, item 6, that location of green tree reservoir site, will be deferred for one year following initial operation of the project.

> 'Page 9-8: The applicant requests that a new paragraph be inserted between existing paragraphs three and four (numbered by the Commission as Items (1) and (2). This puragraph should read identical to the existing paragraph two, page 9-8.

This change is requested since the applicant is in agreement with

G-36

I. MODIFICATIONS SCENG FEELS SHOULD BE MADE IN THE TEXT: ... (CONT'D.)

the Commission's timing (i.e. "within one year following issuance of any license for the proposed project") as set forth by the Commission in existing paragraph two, page 9-8.

This transfer, if incorporated by the Commission, will necessitate remaining existing paragraphs four and five (numbered by the Commission as Items 2 & 3) to Items (1) & (2).

- 16. Page 9-13, last paragraph: The applicant notes for the Commission's attention that this paragraph implies that the applicant will request permission to construct a second 900 MW nuclear unit as part of the V. C. Summer Nuclear Station upon completion and commercial operation of the currently authorized 900 MM unit. Although the applicant has specific intentions to construct a second 900 MM nuclear unit, the applicant respectfully requests that the Commission delete reference that closely brackets the timing of the second nuclear unit.
- 17. Page 9-12, lines 18 & 19: SCE&G feels that the words <u>turbidity</u> and <u>heavy retal concentrations</u> be deleted. Due to the lack of proper instrumentation to adequately monitor turbidity and heavy metal concentrations on a continuous basis, we recommend that these measurements be determined by grab samples taken at monthly intervals, and at a time that would coincide with approximately the 14,500 acre-feet release point from Monticello Reservoir.

AND REPORT REPORT OF

I. COMMENTS BY SCEAG FOR THE COMMISSION'S CONFIDERATION:

- 1. Page 3-9, lines 10-13: Results of SCE&G's Easeline Biotic Survey to date have indicated no beaver in the project area.
- Page 3-29, paragraph (7): As indicated on page 17 of the December 29, 1971, Model Study Progress Report by Alden Research Laboratories (see Appendix I of SCE&G's Environmental Report for Project No. 1894, filed July 26, 1972), other distorted model tests remain to be made.
- Page 4-5, paragraph (3): SCEAG and the U.S. Forest Service have signed a Memorandum of Agreement. A copy of this Agreement is attached to these comments.
- 4. Page 4-10, second and last paragraphs: The Biological Monitoring program is continuing on a quarterly basis, for both aquatic and terrestrial habitat and wildlife.
- Page 4-14, last paragraph: The memorandum of Agreement between SCE&G and the S. C. Department of Wildlife and Marine Resources is only tentative relative to the issuance of a license for Project No. 1894. (See the copy of this agreement included in the FPC Draft Environmental Impact Statement).
- Page 4-15, second paragraph: SCE&S does not disagree with the intention of this paragraph, but we point out that we have recognized that the daily fluctuations in Parr Reservoir would have an adverse effect on the existing sport fishery in Parr Reservoir. To offset this effect, the 300-acre fishing subimpoundment in Monticello Reservoir, to be stocked with bass and bream will be developed.
- Page 4-16, lines 13-16: The locations of these monitoring stations are no longer tentative. There are four stations located as follows:

Upstream Stations

- (a) At S.C. Route 72 and 121, Bridge across Enoree River:
  10' x 10' concrete block building.
- (b) At S. C. Route 72 and 121, Bridge across Tyger River: 8'x8' lined steel building on concrete foundation.
- (c) At S. C. Route 72 and 121, Eridge across Broad River: 8'x8' Ined steel building on concrete foundation.

Downstream Stations

(a) At Parr Hydro Plant, just below Parr Dam: 10'x10' concrete block building.

# 11. COMMENTS BY SCEAS FOR THE COMMISSION'S CONSIDERATION: (CONT'D.)

All instruments are operated on electricity supplied by local utilities.

These changes in location should be reflected in Table 4-2, page 4-18.

8. Page 9-11, last 7 lines, and page 9-12, first 5 lines: SCE&G points out that we have recognized that the daily fluctuations in Parr Reservoir would have an adverse effect on the existing sport fishery there. To offset this effect, the 300 acre fishing subimpoundment in Monticello Reservoir, to be stocked with bass and bream, will be developed.

9. It appears that page R-3 should follow page R-5.

- 111. TYPOGRAPHICAL ERRORS FOUND IN THE TEXT:
  - 1. Page 1-6, line 16: The word <u>steam</u> should be changed to <u>stem</u>.
  - Page 2-3, line 10: The word in-site should be changed to in-situ.
  - 3. Page 4-22, line L: The word areas should be changed to area.
  - Page 4-24, line 21: The words hear and citen should be changed to heal and soften.
  - 5. Page 9-5, line 20: The word <u>Canean should be changed to</u> <u>Cannon's</u>.
  - 6. Page 9-7, first two paragraphs: These should be deleted, as they are repeated from page 9-6.





Re: SCE&G Response to Comments by Others on FPC Draft Environmental Impact Statement—FPC Project No. 1894—South Carolina Electric & Gas Company (Addenda I to SCE&G's October 18, 1973 Comments on FPC Draft Environmental Impact Statement.)

## Dear Mr. Plumb:

South Carolina Electric & Gas Company has previously commented on the FPC Draft Environmental Impact Statement of September, 1973, for Parr Hydroelectric Project (FPC Project No. 1894) in a letter dated October 18, 1973. We have recently studied the comments on the same Environmental Impact Statement made by the Environmental Coalition in a letter of October 27, 1973, and by the U. S. Department of Health, Education, and Vielfare in a letter of October 23, 1973, and we wish to make the following response to these comments as an Addenda to our comments of October 18, 1973.

I. Response to Environmental Coalition Comments

The Environmental Coalition's major concern in their October 27, 1973 letter was that the Draft Impact Statement does not describe the water quality problems of the river in relation to the musty odor problems of Columbia. They are concerned that the proposed Parr project would create a greatly enlarged sink which would be warmed by cooling water from the Virgil C. Summer nuclear station and provide conditions which would enhance the cdor problem of the Columbia water system.

-Their concern is based on a report entitled The Relationship between Substrate Content, Water Quality, Actinomycetes, and Musty Odors in the Broad River Basin. This report was prepared by the Environmental Protection Agency, Surveillance and Analysis Division, Athens, Georgia, in January 1973 and reported the folio ving cane where the recommendations:

"The musty odors found in the Columbia, South Carolina, municipal water supply are not unique to that area, but are a widespread phenomenon in the Broad River Basin. Actinomycetes, common throughout the basin, are the organisms producing the musty odors; however, antinomycete growth and musty odor production appear to be dependent on the influx and storage of organic matter and other nutrients, air and water temperature, rainfall, and stream flow during the spring season. The major tributaries in South Carolina appear to be a primary source of organic matter and other nutrients, while the canals and reservoirs act as a 'sink' for these nutrients, thus providing a substrate conducive to actinomycete growth and odor production."

"Columbia water treatment pioni personnel should create an odor panel and regularly sample upstream in the vicinity of Parr Dam for odors during the spring of the year. Personnel should be prepared to treat the water with activated carbon when air temperatures and water temperatures of 17°C or greater occur during extend springtime low flow (less than 6,500 cfs) periods (2 to 5 weeks) and upstream threshold odors are four or greater. When the above conditions occur, severe odor problems can be expected; therefore, treatment should begin as soon as possible."

"Inputs of wastes from municipalities and industries in the Broad River Basin should be reduced to levels commensurate with available waste treatment technology. Particular attention should be given to wastes from Lockhardt and Carlisle textile mills and discharges into Tributary streams draining the Greenville-Spartanburg area."

It should be pointed out that musty cdor problems are not unique to the Columbia area but are common and widespread throughout the world. These odors are usually associated with metabolites of bacteria, fungi or blue-green algae.

The EPA concluded that the musty odor being produced in the Broad River system is the result of actinomycete activity. This fungus is known to produce two metabolites with powerful musty/eacthy odors. These are geosmin and 2-methylisoborneol, both aliphatic alcohols. Very little is known on the ecology of these organisms. It is known that organic material is necessary for their proliferation and that the metabolites appear to be dependent on the organic matter. Organic materials may originate from natural runoff or municipal or industrial wastes and can be "trapped" by impoundments providing a suitable substrate for actinomycete growth. The EPA report, thus, recommends that more efficient municipal and industrial waste treatment processes be applied upstream to help alleviate this problem.

Increased temperature of water reaching Fair Retervoir as a result of cooling water from the Virgil C. Summer nuclear station is

expected to be a maximum of 3°C as it enters Parr Reservoir and would be further diluted by the waters of the Broad River so that no perceptible increase would be apparent below Parr Dam. This small temperature change would affect only a portion of the reservoir and, therefore, is not expected to greatly enhance actinomycete development.

Musty odors can be treated by activated carbon or charcoal. If Columbia water treatment plant personnel sample upstream for odors as recommended by EPA, odor problems could be diagnosed and propriet for severe odor problems develop.

If it is deemed necessary SCE&G could take odor samples on a weekly basis along with other routine water quality analyses.

11. Response to Department of Health, Education and Welfare Comments

The major concern of the Department of Health, Education and Welfare in their October 23, 1973 letter was that additional school class rooms would be required in the project area schools due to the attendance of children of the 30% of the Project Work Force living in or near the project area. It is anticipated that this 30% of the work force will be permanent residents who already live within 25 miles of the site, and since their children will already be attending local schools, no large additional burden on the local schools is anticipated.

We hope that the above comments will be helpful to the FPC staff in their preparation of the final Environmental Impact Statement for Project No. 1894. SCE&G will continue to respond to other comments made to the FPC on their Draft Environmental Impact Statement for Project No. 1894, as these comments are made available to the company.

Yours very truly,

V. C. Summer

Senior Vice-President

KLM:VCS:ii

M. C. SUMMER an 17 y 17 fres asse

> Mr. Kenneth F. Plumb, Secretary FEDERAL FOWER COMAISSION 1425 K Street, N. W. Washington, D. C. 20426

G-43

COLUMBIA, SOUTH CAROLINA 29202

Jonuary 2, 1974

SOUTH CARDUCA EL

Re: Correction in SCE&G's December 11, 1973 Response to Comments by Others on FPC Draft Environmental Impact Statement-FPC Project No. 1894-South Carolina Electric & Gas Company

N SHAL

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Deat Mr. Plumb:

It has come to our attention that there is an arror in our December 11, 1973 letter to you giving SCE&G's response to comments by the Environmental Coalition and the U.S. Department of Health, Education, and Welfare on the FPC Draft Environmental Impact Statement for Project No. 1894-Parr Hydroelectric Project.

On line one of page three, the phrase "a maximum of  $3^{\circ}C$ " should be changed to read "a maximum of  $3^{\circ}F$ ". This correction should be marked on your copy of the letter.

Yours very truly,

V. C. Summer

KLM:VCS:11

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SOUTH CAROLINA ELECTRIC & GAS COMPANY FULT & PICE LONDER COLUMERA, ROUTE CARDLINA PPPOR

Jonuary 2, 1974

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Mr. Kenneth F. Plumb, Secretary FEDERAL POWER COMMISSION 1425 K Street, N. W. Washington, D. C. 20426

> Re: Clarification of a Statement in FPC Draft Environmental Impact Statement for Project No. 1894-Parr Hydroelectric Project

## Dear Mr. Plumb:

RECENT

V. C. Summer

TEEFELL ACTER CONTINUES

In reviewing the FPC Draft Environmental Impact Statement for Project No.1894 (Parr Hydroelectric Project), the South Carolina Electric & Gas Company has encountered a statement with a possible dual interpretation. On page 9-2, line 2 of the Draft Environmental Statement, the following sentence seems to have more than one possible meaning: "To maintain the benefits of a shoreline buffer strip, access should be controlled by the Applicant."

SCE&G would like the FPC to clarify this statement so that we can more readily finalize our land acquisition program for Project No. 1894. We would like to know if it will be Commission policy in this project 1) that the quoted statement will require the Applicant to purchase all the lands within the shoreline buffer strip in fee, in order to have complete control of the area, or 2) that the statement will be adequately covered by the Applicant's purchasing easements restricted by the necessary covenants to give SCE&G the required shoreline control.

At the present time SCE&G is negotiating with one of the large landowners in the project area, who wishes only to grant easement for his lands between the maximum Monticello Reservoir elevation and the project boundary, instead of selling the land in fee. Clarification by the FPC of the statement on page 9-2 of the FPC Draft Environmental Impact Statement would help SCE&G to conclude its dealings with this landowner and with others, and would facilitate the timely removal of marketable timber in the project area, thereby avoiding destruction of a valuable natural resource.

# G-45

# SOUTH CAROLINA ELECTRIC & GAS COMPANY

POST OFFICE BOX 764 COLUHBIA, SOUTH CAROLINA 29202

V. C. SUMMER

## 9 January 1974

Mr. Kenneth F. Plumb, Secretary FIDERAL POWER COMPLISSION 2425 "K" Street, N.W. Washington, D.C. 20426

EE: SCE&G'S Response to Comments by Others on FPC Draft Environmental Impact Statement - FPC Project No. 1894 South Carolina Electric & Gas Company (Addenda II to SCE&G's October 18, 1973 Comments on FPC Draft Environmental Impact Statement)

Dear Mr. Plumb:

South Carolina Electric & Gas Company has previously commented on the FPC Draft Environmental Impact Statement of September 1973 for Parr - Eydroelectric Project (FPC Project No. 1894) in a letter dated October 18, 1973 and in a letter of December 11, 1973 (Addenda I).

We have considered comments on the same Environmental Impact Statement made by (1) The United States Department of Interior in their letter received by the Commission's Docket Section November 9, 1973, end (2) the Office of the Assistant Secretary of Commerce in their letter mailed to the Commission and dated November 19, 1973. Our responses to the comments made by these agencies are attached.

Very truly yours,

V.C. Summer

Senior Vice President

VCS/sgp Attachment I. RESPONSE TO DEPARTMENT OF INTERIOR CONTENTS DATED NOVEMBER 9, 1973 BY THE COMMISSION'S DOCKET SECTION.

Department of Interior Letter, page 1 (General Comments)

Comment

"There is no evidence to indicate the details of these proposals (for various biological studies to identify the fish and wildlife resources and environmentally desirable project modifications) have been finalized or reviewed by the appropriate State and Federal egencies."

#### Response

The details of proposed or existing biological studies or project modifications for fisheries resources are:

a) A continuing biological program for water quality and aquatic resources that began in 1971 and is presently in progress. This program forms the basis of baseline conditions and predictive effects. Details of the sampling program, including stations, sampling frequency, and data obtained are contained in the annual report which will be shortly available.

b) The proposed construction phase of the biological sampling program is essentially a continuation of the existing program with increased emphasis in areas where construction effects may occur. Birds are considered good indicators of terrestrial environmental change, and the following is a description of the construction phase bird monitoring program:

To complete the second full year of baseline information, a January 1974 survey is necessary and will include the auto survey, strip census, and the waterfowl census. The auto survey will then be discontinued until the filling of Monticello Impoundment. The waterfowl census, which is also associated mainly with the pumped storage facility, would be run again during late May or early June after dredging has begun.

The strip census will be used to determine effects brought about by the construction of the nuclear facility. This census would be run in the construction area as well as control areas; areas unaffected by construction activity. Changes in species composition and abundance will be noted. Census dates were selected to observe greatest avian activity during the four seasons; January,-March, late May or early June, and September.

ADDENDA II, Page 1

A DAY AND A DAY AND A DAY

Aerial color infrared photographs of the project area will be obtained in 1974 and continued on an annual tasis through the second year of commercial operation of the Pumped Storage Project. This data will provide a history of lumbering and construction operations as wellas more clearly delineate forest type, possible disease and insect infestations which may otherwise be speculated as being a result of the plant operation.

The planned photographic flight will obtain color infrared exposures at the scale of 1" = 2,000' utilizing ASTACS (Automatically Stabilized Airborne Camera Systems) and precision Zeiss R-K A 15/32 mapping camera. The mapping flight will cover an area of approximately 30 square miles and will be conducted during the spring, immediately after the hardwoods have leafed out. Analysis will be conducted utilizing an electronic multi-spectral scanner.

The aquatic program is scheduled to begin during the spring of 1974. Efforts will be concentrated on determining iredging effects on the aquatic blota. Four stations will be sampled for plankton, benthos, and fish to monitor changes in species composition and abundance. Special emphasis will be placed on turbidity effects as they relate to primary productivity, adverse silting effects on benthos, and spawning activities of fish. It is anticipated that three surveys will be conducted during 1974; block-netting and rotenoning to determine fish bionass would be conducted during the summer survey. Methods utilized will be the same as those established during the baseline survey.

c) The proposed operation phase monitoring program has not been finalized at this time. Its major outline will be similar to the baseline and construction phases. However, specific studies will be undertaken to determine effects of entrainment, impingement, thermal and chemical effluents, and water-level fluctuations.

The existing water quality and biological monitoring programs have not officially been reviewed by state or Federal agencies with the exception of the AEC review in the 1972 Environmental Report. This report, however, has been circulated to all interested agencies for comment and it is assumed that questions or comments relative to the monitoring programs would have come forth.

ADDERDA II. Page 2

Comment:

No data on heavy metal content of incoming waters and sediments was presented. Concern was shown for the potential concentration and accumulation of heavy metals in Parr, Monticello, and the recreation lake impoundments and their potential affect on aquatic life.

# Response:

A program to define current levels of heavy metals in the water will begin in 1974. The parameters and frequency of sampling has been outlined in response to the comment on monitoring programs.

Suspended solids in river water are known to scavenge heavy retals from solution and result in their deposition in the sediments of lakes and streams. There, these metals may be available to benthic feeding fish and invertebrates, particularly those that are detritivores. Therefore, the sediments were analyzed for certain heavy metals as well as pesticide concentrations.

Concentrations of DDE, DDD, and DDT from all samples were generally very low and were often below the detectable limits of 0.005 ppn. No other pesticides were detected in the bottom sediments. Similar findings were made for surface soils of the surrounding study area, although the frequency of occurrence of samples containing no pesticide residue was greater. Concentration (in ppm) of pesticides found in the bottom

sediments are as follows:

Transect	DDE	CCC	DDT
A B C	0.005 0.009 0.007	0.005	0.005
D E F	0.007 0.005 0.005	0.007 0.008 0.005	· 0.009 0.009 0.005

ADDENDA II, Page 3

Polychlorinated bi-phenyls (PECs) were present in moderate concentrations ranging from 0.010 to 0.044 pps. The highest concentration was found at Transect E, directly below Parr Das.

Boron was present in the highest concentration (100-194 ppm) of the minerals measured in bottom sediments (Table 1). Concentration of all other minerals measured were low. Lithium and zinc concentrations were generally low, but in all cases higher than those in the surrounding topsoil. With the exception of lithium, mineral concentrations were highest in and below the reservoir. Lithium, zinc, and arsenic concentrations were greatest at Transect E, directly below Parr Dam.

The following heavy metals will be analyzed during the first quarter of 1974 to document their concentrations and to determine if further monitoring is warranted because of excessively high concentrations:

Aluminum	Magnesium	Silver
Beryllium	Manganese	Stronti
Boron	Molybdenum	Tin
Cobalt	Selenium	Vanadiu

The following heavy metals will be analyzed on a monthly

basis beginning with the first quarter of 1974:

Arsenic	Copper	Mercury
Cadmium	Iron	Nickel
- Chromium	Lead	Zinc

The samples for heavy metal analysis will be taken at the

following locations:

Broad River at Highway 34.
 Frees Creek at Southern Railroad.
 Frees Creek 1 mile upstream from Southern Railroad.
 Frees Creek at Highway 99.
 Broad River at Parr (Ferr Reservoir at Dam)
 Broad River at Highway 213.
 Broad River at Richter.

8. Broad River at I-20 Bridge

ADDEDA II, Fage 4

Monthly analyses for oil and grease will be made on samples

ADDENDA II, Page 5

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# taken at the following locations:

- Broad River at Highway 34.
  Broad River at Parr (Parr Reservoir at Dam).
- 3. Frees Creek at Southern Railroad Trestle.
- 4. Broad River at Highway 213.



ADDENDA

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Table 1 Concentration of minerals in bottom sediment samples from the Broad River Study Area at Parr, South Carolina, February 1972. All values are in parts per million.

						·····		
Transect	Arsenio	Copper	Zino	Lead	Meroury	Boron	Chromium	Lithium
•	· .		<u> </u>		······································			•
A B C D E	0.020 0.020 0.020 0.027 0.027 0.160	6.96 13.90 21.70 25.20 10.70 5.10	27.0 30.2 30.3 30.4 36.9 21.9	6.24 18.40 20.20 14.60 8.83 5.12	0.008 0.042 .0.033 0.038 0.017	100 142 160 174 168	22.80 36.50 25.20 35.40 24.60 20.10	3.92 2.80 2.32 .3.64 8.28

RESPONSE TO DEPARTMENT OF INTERIOR CONDITIES.

Dept. of Interior - pg. 4 (Fish and Wildlife Scot. 2.8)

Comment: "This section of the final statement should identify the quantity and quality of fish habitat to be affected by project implementation."

Response A of A and B:

There are four basic aquatic habitat types represented in the project area that may be affected. NOTE: Trrestrial habitat types discussed in Response B that follows.

a) A section of the free flowing Broad River above the present Parr Reservoir level.

This 23 km section of the river is relatively constant in width (ranging from approximately 350 to 700 feet) and has a low gradient of less than 1 ft per mile. The river is generally shallow with maximum depths of less than 20 feet and much of the river of five feet or less.

There is little to no aquatic macrophyte growth in the river, however, the banks are characteristically grassy with trees near the edge or overhanging the water. Eanks are generally steep-sided, and there are few islands in this section of the river.

Bottom types vary from silty cand in the slower areas to sand in the more scoured areas. Rocks occur infrequently and are primarily in the area immediately below Henderson Island. Downed trees occurred along the river bottom.

This section of the river is suitable for a variety of fish species that prefer moving water and provides little quiet water and back eddies. It is suitable spawning area for many fish species that require moving water and firmer bottons than are present in Parr Reservoir.

b) A semi-free flowing habitat within Parr Reservoir.

Because of a siltation and shallowing a large part of Parr Reservoir has become riverline in nature and experiences water movements similar to the river but of generally lesser magnitude. The riverine haditat within Parr Reservoir ranges from a relatively straight, narrow upper end with few islands to larger open areas characterized by vegetated islends and shifting shallows and backwaters.

Reservoir width varies greatly, from approximately 500 feet at its upper end to 2800 feet near the dam. Depths may be 20 to 25 feet, in the charmel near the dam, but most of the lake has depths averaging only 3-4 feet. This section of the river provides habitat for all species of fish known to be in the reservoir, but is probably loss productive than embryment portions.

c). Enbayment habitats within Parr Reservoir

Frees Greek, Hellers Creek, and Cannons Greek embeyments are the major representatives of this lentic type of environment. Fogether they form about 22% of the total Parr Reservoir surface acreage.

Embayment widths vary from a few hundred feet to nearly 3/4 mile, and in length from 0.5 to 5.3 miles. Channel depths are 12-15 feet, however, depths just out of the channel quickly change to 4-6 feet and become shallow toward shore. Embayments are characterized by little current flow, an abundance of submerged partly emerging dead trees, and the variable influence of their small feeder streams.

Banks are generally only moderately to slightly steep and often overhung by trees which extensively shade the margins. Bottons are silty, becoming more mandy as the creek mouth is approached.

These embayments are generally richer in fish habitat than the more open water, however, Cannons Creek Embayment appears to support several times the starding crop of fish than does Frees Creek Embayment.

d) The free-flowing portion of Frees Creek

About 7 miles of Frees Creek will be affected. This small stream flows from an elevation of approximately 450 feet and has an average drop of about 20 feet per mile. The drop is greatest in the upper 1/4 of the creek, averaging 33 feet per mile and besser in the lower 3/4, aversging 12 feet per mile.

The stream is small, the width averaging 10 feet or less. Water depth is generally less than a foot and is usually a few inches. There are some deeper pools formed around branchos and debris, but nost of the orack is riffle or shallow pool. The stream bottom is generally of sand, ranging from coarse to fine. There is very little rock and thus the bottom tonis to be unstable.

The creek runs through a mixed depiduous and pine forest and is heavily shaded. No rooted macrophytes are present. In contrast to the Urand River, Frees Greek is often clear, and turns turbid only after heavy tains.

The surver appears to provide your fish habitat because of its in the second difficult bottom. No fish from Parr Reservoir are known to

	Catomark	Shoraling Miles	Acrease
E.)	Broad River	16	740
Ъ)	Reservoir without enboyments	18	2300
c)	Entarients	11	660
a)	Frees Creek	- 14	· · · · ·

Sec. 1.

ADDENDA II, Page 9

\* includes both sides of the stream or erbayment

Response B of A and B:

These are four irrestrial habitat types within the project area that may to affected.

Four major habitat categories were identified on the project area and include the following: pine plantation, mixed pine-deciduous woodlands, deciduous woodlands, and grasslands (cultivated and abandoned farmland). The approximate percentage of each major type that will be inundated by the project impoundments is as follows:

Parr Reserve	<u>oir</u>		Font	icallo impound	<u>ent</u>
Pine	2%		•	47%	•
Mixed	5%			26%	
Deciduous	85%		1. S.	15%	
Grasslands	上兴			12%	

The quality of the woodland communities to support a diverse and an abundant fauna is dependent upon the site characteristics, age structure of the forest, and density of the canopy. These factors have a direct influence on the development of herbaceous vegetation and shrubs which, in turn, is part of the life-support system of woodland wildlife.

The site characteristics that influence lower story productivity include the slope, moisture retention properties, and organic content of soils. Pine plantations usually occur on the upland sites that are well drained and slightly acidic (pH 5.0 to 5.5). The nutrient levels in the uppermost soil layer are not well developed because pine needles decompose slowly. Deciduous leaved shrubs and herbaceous vegetation do not grow readily in these mildly adverse conditions.

The deciduous leaved tree sites, along the Broad River and tributary creeks, are moderate to poorly drained and provide a better substrate for the growth of herbaceous or shrub vegetation. The decomposition

MORDA II, Page 10

of dootdoors leaves results in more mitrionts available and an improved nutrient exchange between the soil and vegetation.

The age-structure and density of a forest influences the penetration of sunlight to the forest floor. The amount of sunlight that reaches the substrate is reduced in a meture and/or even-aged stand of trees having a dense canopy. A stand composed of uneven-aged trees will allow sunlight to reach the substrate more readily.

The monitoring program included the analysis of vegetation on five study sites representative of the four major communities on the project area. The five sites include the following: two sites in pine plantations of two different-age classes, one site in a mixed pine-deciduous community, one in a predominantly deciduous forest, and one site in a grassland where pine seedlings had been planted. All five sites are in the vicinity of the Konticello Impoundment. Each habitat community is described in more detail in the following paragraphs.

### Pine Eabitat

The coniferous communities to be inundated consisted mainly of loblolly pine which produces a closed canopy forest with a sparse understory of herbaceous vegetation. Only limited numbers of pine seedlings and saplings are capable of growing under the dense canopy which reduces light penetration to the substrate.

Two pine plantations representative of the project area were described by the following techniques: the point-centered-quarter method was used to obtain relative density, relative frequency, and relative dominance of trees over 2.5 cm d.b.h.; diameter at breast height (d.b.h.) was measured to characterize age-classes; and the frequency of occurrence was obtained for shrubs, hereaceous vegetation and other ground species from b0 creations is required an interactionally placed in each habitated Notices 2 and 3 show the diversity and the relative frequency, density, and dominance, and importance value for trees found on the two pine plantations rampled. Loblelly pine is the most important species on both sites. Herbaceous and woody vegetation is not abundant on either site (Table 4). In the first pine plantation, Schribner's panicum, blackberry and dandelion occurred in more than 25 percent of the quadrants. The second pine plantation sampled shows a greater diversity and frequency of herbaceous and woody vegetation. The understory vegetation in the second plantation was studied one year following the selective remove of the mature pine for pulpwood.

The quality of the pine communities in regard to supporting wildlife is considered to be very poor because of the sparse understory. Neither shelter, forege nor browse was significantly available to wildlife.

A variety of songbirds were recorded in pine plantations during two seasons (Table 5). The density of birds was low in the pine plantations. Game birds such as turkey and bobthite are also low in abundance because the available nuts, fruits, seeds and shelter is sparse. Small nammals were consused in two pine plantations for five days in each of four seasons (Table 6). Of the total small-mammals collected, seventy-eight percent were in the second pine plantation where the understory vegetation was more abundant. Golley, et al. (1965) also found small mammals to be low in abundance in pine plantations.

No furbearing or game mannals were observed or trapped in the plantations. Cottontail rabbits, however, were observed or trapped in there an ecotome between a pine plantation and pressland where food and

Altantiz, rege 13

protective cover were more plentiful. Browse for white-tailed deer is very sparse in pine plantations with only limited amounts of Walter's smilar, honey-suckle, blackberry, and dogwood.

## Mixed Pine-Deciduous Habitat

Of the mixed pine-deciduous communities to be inundated by Monticello Impoundment, 73 percent consists of areas where pine was selectively removed. The hardwood understomy was predominant on aerial photographs, resulting in those areas being classified as mixed pinehardwood community.

The mixed pine-deciduous study site was located along the sloping shoreline of Frees Creek, near the Broad River. Loblolly pine, eastern red cedar, and red maple were the most important species (Table 7). Loblolly pine was the dominant species within the area, but eastern red cedar was the most dense.

A variety of species comprised the understory with Walter's smilax being the nost frequent woody plant and sedge the most frequent herbaceous plant (Table 4). The understory was diverse because sunlight could penetrate the multi-agedend diverse forest to reach the understory and substrate and deciduous leaves provided a better humus layer on the soil.

The quality of the "mixed" habitat for wildlife is probably fair but limited in distribution as ecotones between pine plantations and the deciduous forests on the bottomlands. The distribution of "mixed" habitats on the project area and the low frequency of potential food plants is representative of the over-all low quality of the project area for native wildlife species. The understory vegetation includes a veriety

ADDETEDA II, Page 13

of plants valuable as browse or food for white-tailed deer, turkey and bob-white quail. However, none was abundant.

Native wildlife populations in the "rixed" community were low in abundance. Song birds were more abundant in pine habitat than "mixed" habitat (Table 5). However, the "mixed" habitat, where birds were consused, contained significantly more nature deciduous woodland habitat than pine habitat. Small maximals were more abundant in "mixed" habitat than the pine habitat (Table 6).

Medium sized manuals recorded in "mixed" habitats include an occasional gray squirrel and white-tailed dear. Four opossum and one raccoon were livetrapped along upper Frees Creek.

The northern two thirds of Frees Creek flows through habitat that includes all four major types, but with a dominance of "mixed" and deciduous woodlands. Openings created along the creek by highway intrusion or farming activity, or tree windfalls exhibit a fairly lush growth of shrubs, vines, and some herbaceous vegetation. This narrow band of habitat along the creek represents the best quality habitat for mammals and birds. Its distribution, however, is limited.

Deciduous Woodlands

Deciduous woodlands are distributed primarily along the flood plain of the Broad River and its tributaries. These woodlands are typically composed of nature, dense stands that restrict the light penetration which inhibits the growth of understory vegetation.

One study site was established among hardwoods on a tributary of Frees Creek. The stand was not described by the point-centered quarter method, but the frequency of understory vegetation was obtained

within the stund (Table 1). Herbscecus vegetation is almost absont while woody plants were present but not abundant. Walter's smilax was the most frequently occurring understory species in this hardwood stand. The understory of hardwood forest along the bottomlands of the Broad River was often limited to sadge and bashoo. Woody plants in the understory were generally absont except where light reaches the substrate along the stream banks and in man-made and naturally occurring openings. Man-made openings are not common in the deciduous woodlands along the Broad River in the project area.

The deciduous forests in the boitomlands along the Broad River and tributaries will not support many white-tailed deer, turkey, bobwhile, and squirrel. Although the mature trees produce an annual mast crop (accomms, cood, etc.), the mast is generally available to jurkey and squirrel, but not readily available to white-tailed deer. Browse and forage for deer is not abundant either as indicated by the low abundance and diversity of woody and herbaceous vegetation. Understory vegetation increases abruptly in openings created by abandoned farm fields, railroad and transmission line rights-of-way, and ebandoned form fields. These openings do not contribute sufficiently to the wildlife cover to warrant the classification of the Broad River bottomlands as productive wildlife habitat.

## Grasslanis

The grassland community type included seven percent cultivated or pasture and five percent abandoned farmland. Abandoned farmland included computities representing several seral stages of succession.

The study site consisted of plantation yine approximately three years in the plantation of the state of the substance of the 2.5 cm.

Vocotation on the site typifies an early successional stage of a disturbed site. Encoursedge was the most important grass species on the site (Table 8) with triple-awned grass being the next rost important. The density of grass species (6,756 plants/ha) contributed to a total ground cover of 9.8 percent.

Grasslands provide an important link in the requirements of wildlife on the project area. The quality of grasslands to support wildlife is variable according to the current land-uses. Grazed pasture and cultivated fields are important to the few mourning dove and bobwhite. Abandoned farmland in various stages of succession are important to such game species as bobwhite, mourning dove, turkey, white-tailed deer, and cottontail rabbit.

Mourning dove call counts conducted on the project area during the same period that the national surveys are conducted showed the population to be low on the project area. An average of 7.5 doves were heard per route on the project area in 1973 as compared to an average of 49 doves heard per route in 1970 on the best region of South Carolina, the Carolina Sandhills National Wildlife Refuge. Small grain cultivation is important to this game bird, and not abundant on the project area. Song birds were most abundant in the abandoned fields studied on the project area (Table 5). The highest diversity and often the highest abundance of small mermals was collected in a gressland (Table 6).

The distribution of abandoned farmland is another limitation on the carrying capacity for native wildlife species on the project area.

The ecotone that forms between grassland and formest land also is important in the distribution of wildlife. The edge provides mesting

APPENDA JI, Pogo 16

sites for many song birds, as well as a divensity of plants for cover and food for bobuhite quail, turkey, white-tailed deer, and contontail rabbit.

The overall quality of the environs on the project area is low. Mixed habitat of pine and deciduous traces is the best quality because of an uneven aged stand of timber. The broad age distribution increases the probability of shrubs and herbaceous vegetation growing near the ground. The nature trees of the dociduous forests and the dense stand in pine plantations retard the development of understory vegetation important to woodland wildlife. A few, but insufficient, openings occur amoung the deciduous forests and pine forests where understory vegetation is present and encourages some faunt development.

The overall quality of the habitat to support wildlife will improve slightly as a result of lumbering operations. Timber cutting activites throughout the region are increasing forest openings. Understory woody and herbaceous vegetation will increase under these openings and an increase in the carrying capacity of the project area for wildlife is enticipated.

ADDENDA II, Page 17

Relative frequencies, densities, devinance and importance values of tree opecies (2.5 on or greater dbh) growing in Site 14 of the Broad Mayor Study Area, June 1971.

Species	Relative Freguency	Relative Density	Relative Dominance	Importano Value
Loblolly Pine	52.9	69.4	80.8	203.1
Sweet Gum	21.4	18.0	139	53.3
Flowering Dogwood	11.2	6.3	2.7	20.4
Eastorn Red Cedar	7.1	3.1	1.5	11.7
Tulip Tree	2.9	1.3	.6	4.8
Hop-hormbean	2.9	1,3	- <u>1</u> 4	4.6
Red Maple	<u>1.h</u>	0.6	2	2.2
Totels	100.0	100.0	100.1	300.1

ADIETA II, Page 15

Table 3

Relative frequencies, densities, dominance and importance values of tree species (2.5 cm or greater dbh) growing in Site 4 of the Broad River Study Area, June 1971.

·					
Species	Relative Frequency	Relative Density	Relative Dominance	Importance Value	
Loblolly Pine	60.7	81.3	85.9	227.9	
Eastern Red Cedar	12.2	6.3	5.1	23.6	
Holly ø	6.1	3.1	1.5	10.7	
Black Cherry	<b>4.5</b>	2.5	2.4	9.4	
Oak sp. 1	4.5	1.9	1.8	8.2	
Red Maple	4.5	1.9	0.9	7.3	
White Oak	1.5	0.6	0.9	3.0	
Hop-hombean	1.5	0.5	0.6	2.7	
Ozk sp. 2	1.5	0.6	0.3	2.4	
Willow Oak	1.5	0.6	0.3	2.4	
Sweet Gum	1.5	0.5	0.3	2.4	
Totals	100.0	100.0	100.0	300.0	

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Teble 4

Frequercy of occurrence (%) of understory, herbaccous, and wetly plant species (means within pint, herbaccol, mixed pineherdwood, and grassland environs in the Broad River Study Area.

browth Form	•		OTJUCETON S	TTRA		
Conton Nate	l Pine l	1B Hard- wood	2 Grass- land	3A Mixed	لب Pine- 2	
Vascular Cryptogans						 
Fern	4	. –	<b></b>	10	<b>-</b> .	
lerbaceous Forbs			•		•	
Arrownead	-	-	10	10	-	•
Aster	-	• ••	10	· ·	10	
Bundle Flower	. –	-	-	-	15	
Cinquefoil	-	8	_	5	-	
Common Regweed	-	-	5	-		
Dandelion	28	-	<b>—</b>	-	-	
Goldenrod	12	-	20	<b>-</b> '	5	
Heartleaf	-	-	-	20	— ·	
Lespedeza	-	-	5	-	10	• •
Pussy's Toes	÷	-	_	-	5	
St. John's Wort	4	-	—	-		
. Wild Ginger	-	-		20	-	
Wood Sorrel	20	-	-	-	-	
rasses						
Banboo	-	-	-	35		
Bermida Graso	24		-	-	-	
Process Sector		•.	12	•	1.5	
Drownsech	<b>–</b>	-	10	-	-	
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Growth Form						
Common Name			COLLECT	ON SIVES		
	l Pine l	13 Hard- wood	2 Grazs- lani	JA Nixed	4 Pine 2	
Cane Blucstem		-	14			
Indiangrass	-	-	-	10	30	
Little Bluesten	-	<b></b>	45	<b>.</b> .	30	
Scribner's Panicua	. 28		30	15	25	
Three-awned Grass	· _	-	40	-	-	
Sedges			•	-		
Sedge	-	20	-	45	-	
Woody			•	•		
Snrubs		•				
American Holly	8	16	-	15	15	
Blackberry	28	<b>-</b> ,	5	-		
Rose	4	8	15	-	-	
Trees (<5 cm d.b.h.)		•••••				
American Hornbeam	. <b>–</b>	4.	-		-	
Black Cherry	4			-	-	
Black Oak	· _	8	-		-	
Dogwood	-	4		<b>-</b> ·	15	
Eastern Red Cedar	4	-	_	10	-	
Hawthorn	4	ŀ	<b>-</b> .	-	• 	
Laurel Oak	<u>1</u> +	28	Ĺ.	- 15	10	
Internet Pice	1.0	<i>.</i> 20	۲	25	25 25	
Pignut Hickory	-	*	••• ·	5	<b>-</b> .	

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# Table 4 (Continuea)

GIOWIN FORT			COLT TO TO	3 87820	-
Common Name	l Pine l	1B Hand- vood	2 Grass- Land	3A Mixed	4 Pine 2
Red Maple				5	-
Sugarberry	-	3	-		-
Sweet Gum	8	4	<del>-</del> .	5	. –
Water Ozk	4	8	<b>—</b>	5	5
White Ash	-	-	-	5	-
Winged Elu	12	20	-	15	
Vines		·			•
Honeysuckle	. 72	16	25	<b>-</b> ·	
Walter's Snilax	4	52		50	15

ADDENDA II, Page 22

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Dealish Number of Eirds <sup>3</sup>	Spr	re Sum	Grass Sor	<u>Uerid</u> Sun	Spr.	Suz	
Hawks	1	. 0	. 0	0	2	0	
Bobwhite	0	Ū	2	7	6	0 .	
Mourning Doves	0	0	0	ì	· 0	0	
Woodpackers	· 3	0	l	0	2	2	
Flycatchers	Ō	2	0	1	0	8	
Svallevs	0	2	0	1	0.	0	
Blue Jay	l	5	0	i	- 0	1	
Brown-headed nuthatich	2	0	0	0	0	, <b>O</b> -	
Carolina Wren	l	0	Û Î	0	6	0 .	
Thrushes	3	2	0 .	0	3	2	
Kinglets	2	0	Ο.	0	3	0	
Warblers	6	18	0	15	12	0	
Eastern Headowlark	0	0	22	9	0	0	
Cardinal	0	2	Ő	0	· 1	1	
Sparrows	9	8	18	15	13	0	
Total Species Total Birds per	17	15	8	20	17	10	
40 hectares	92	216	89-201	252-378	63	-	

A surpary of binds recorded during strip contacts in three habitats. . Tablc 5

1Birds of two grassland communities were censused and combined to form this sumary.

<sup>2</sup>Mixed refers to a mixture of pine and deciduous leaved trees.

<sup>3</sup>A selected list of the total species counted.

ADDENDA II, Page 23

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tible 6 Relative abundance of small mamma\_ collection traplines in S. By Sites 1A, 2, 3A, and 4.

the second s						•		• مداخد فخز بسالیت بستان وی	
Study Site Animal	6/71 Tota No. Caug	Survey 1 Trap- nichts/ ht Animal*	<u> </u>	<u>Survey</u> Trag- nights/ ; Animal*	<u>1/72 Su</u> Total No. Caught	Trep- nights/ Animal*	<u>3/72 s</u> Total No. Caught	urvey Tray- nichts/ Animal*	•
Site 1A (Pine) Total Trapnights Cotton mouse	2	<u>300</u> 150	- <del>0</del>	360	<u>2</u>	<u>եօ</u>	2	240 120	
Total traphights		240		360	2	1,0		21:0	
Cotton Rat	2	120	6		2	120	0		
House mouse	4	60	7	51	0		Ο.		
Cotton mouse	0		1	360	' 3 ·	80	3	SO	
Cottontail rabbit	0	· •	2	180	0		0		
llarvest mouse	0		0		1	240	. 3	80	
Site 3A (Nized)									
Total Trapnights		5110		360	2	10		2140	
Shortail shrew	1	240	4	. 90	3	80	1	240	
Cotton mouse	4	60	5	72 .	Ō		3	· 80	
Cotton rat	0	· • • • • • • •	Ö ~		0		j.	240	
litto h (Pine)		• •							
Total Traphtshts		1.80	· ·	360		lio		570	
Cotton mouse	3	60 .	4	SIC	1	240	1	:240	
- Golden mouse	2	90	1	360	0		0		
Shorttall shrew	0	مەربىد	1	360	Ó		0		
Pine vole	0		0		1.	2/10	0	100 Ted	••
·	:	•				· · · •	-		

\* Trapnights per animal caught.

ADDENDA II, Page 24

G-69

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Relative Frequencies, Scheltice, Schlanse and importance values of tree species (2.5 on or greater Will) Growing in Site 34 of the Broad River Study Area, June 1971.

Species		Relative Frequency	Relative Density	Relative Dominance	Inportance Value
Loblolly Pine		16.0	18.6	21.7	56.3
Eastern Red Codar		16.0	19.2	13.0	48.2 ·
Red Maple	•	13.4	14.8	13.5	归.7
<b>Ash</b>	•	8.4	6.2	9.2	23.8
Hop-hornbeam	· ·	7.6	5.6	6.8	20.0
Cak sp. 1		7.6	6.2	5.4	19.2
Shegberk hickory		5.9	4.7	6.0	16.6
Hickory sp.	•	5.0	.4.7	4.3	14.0
Oak sp. 2	, · ·	3.4	3.8	4.6	11.8
Ozk sp. 3		4.2	3.1	4.1	11.4
Ironwood	•	2.5	4.7	3.3	10.5
Zesswood		3.4	3.8	3.3	10.5
Live Oak	• • • • •	2.5	1.8	3.0	7.3
Flowering Dogwood		1.7	1.2	0.5	3.4
Redbud		1.7	1.2	0.5	3.4
Willow Oak	• • •	0.7	0.6	0.8	2.1
•	Totals	100.0	100.2	100.0	300.2

ADDENDA II, Page 25

 Pable 3
 Reletive Droputser, donsity, and dominant of the various gross species within a pine planitien in the Dropt Eight Area.

Speciez	Relative Frequency	Relative Densily	•	Relative Dominance	Importance Velue *
Broolsedge	34.1	38.7		61.3	134.1
Triple-avned Grass	32.7	27.5		14.7	73-9
Little Bluesten	22.0	23.7	•	16.6	62.3
Witchgrass	7.3	6.3	-	3.5	17.1
Brownseed	4.9	3.7		3.9	12.5
Totals	100.0	99.9		100.0	299.9
- Linguese		•		S 27	• • • • • •

\* Importance value is the sum of relative density, relative dominance, and relative frequency.

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G-71

#### FISH AND WILDLIFE SECT 2.8 CONTINUED

Comment:

Response:

The final statement should recognize white-tailed deer, the most important big game species in South Carolina, as one of the primary game species within the project area. Several years ago, the South Carolina Wildlife and Marine Resources Department erpanded their Central Piednont Game Management Area to include the project area. The excellent habitat in the Parr Reservoir and Frees Creek area is typical of the habitat responsible for the markedly increased populations of deer and turkey in the entire game management area. The abundance of escape cover and herbaceous and woody browse plants within the bottomlands, mast production in the mixed stands, and the interspersion of uneven-aged timber stands are responsible for the maintenance and productivity of these populations.

The white-tailed deer is probably as important a game animal on the project area as are bobwhite and cottontail rabit. Ecwever, population levels are low for all three species. The habitat characteristics of the area bordering Parr Reservoir and Frees Creek does not provide an abundance of woody prowse for deer. or herbaceous cover for quail and rabbit. The bottomlands of the Broad River are composed primarily of mature, dense stands of cottonwood with some oak, maple, and sweetgun. The trees cordering Frees Creek represent a narrow stand of mature oak, maple, hickory, and sweetgum that merge with the pine plantations or grasslands on the slopes and uplands. The dense canopy restricts the emount of light that penetrates to the forest floor and inhibits the development of an understory. Only a limited number of openings near ponds, grasslands, and along the right-of-ways for roads, transmission lines, and the railroad have a diverse understory of plants suitable for prowse or cover. The majority of bobwhite end rabbit utilize cover in or near these openings, particularly near abandoned farmland.

Although habitat quality for the entire Central Piedmont Game Management Area is reportedly high, the present quality of the project area is capable of supporting only a low density population of white-tailed deer due to lack of sufficient browse and cover.

ADDENDA II, Page 27

FISH AND WILDLIFE SECT 2.8 continued

Comment: The statement that several species of ducks, other than wood ducks, have been reported as "transients" in the project area implies the relative unimportance of these species. We point out, however, that the majority of waterfowl in the Broad River area and South Carolina is composed of wintering species that are not permanent residents.

Response: A total of 188 ducks of eight species were recorded on the project area during a November 1972, waterfowl survey. Survey, conducted in March of 1972 and 1973 revealed 195 ducks (6 species) and 231 ducks (8 species), respectively, on the project area. On 5 January 1972, South Carolina State Game Biologists conducted a midwinter waterfowl survey on the Broad River from Lockhart through Parr Dan. The biologists counted 40 mallard, 6 black duck, and 51 wood duck (Walter Schroder pers. comm.). Wood ducks represent 51 percent of the total counted in November, 13 and 20 percent counted in March 1972 and 1973, respectively, and 52 percent of the total counted by state game biologists in January 1972.

South Carolina is in the Atlantic Flyway and the 1972 winter survey, conducted during the period January 3-10, counted 238,000 dabbling ducks and 31,800 game divers in the census region of the Coastal Flain.<sup>1</sup> These figures represent approximately 32 percent of the total dabblers and 1 percent of the total divers censused from Maine to Flordia. Migratory waterfowl is an important resource in South Carolina.

Although transient waterfowl are found in the project area, the muchers are relatively insignificant compared to the waterfowl that reside in South Carolina during the winter.

Lady, C.E. 1972. 1972 Winter Survey-Atlantic Flyway. Mimeo. 7 p.

ADDENDA II, Page 28

# Dept. of Interior - Pg. 4 (Existing Recreation Sect 2.9)

"This section should quantify the total consumptive, and non-consumptive fish and wildlife oriented recreational used of project lands; in particular, the proposed reservoir sites and transmission line corridors."

Response:

Comment:

se: Response for fish and wildlife are made separately.

The "Consumptive" wildlife on the project area include such game birds as bobwhite quail, mourning dove, and turkey, and such marmals as squirrel, cottontail rabbit, and white-tailed deer. The abundance of each species is low and hunting is probably only by local residents, however, no harvest information is evailable for the project area.

The project area is in the Central Piedmont Hunt Unit where 2,135 deer were harvested before November 20, 1973 and 2,452 deer were killed during the entire 1972 hunting season. A record harvest occurred in 1972 and will be even higher by the end of the 1973 hunting season.

Based on the habitat available and the observation of deer and signs of deer, the populations within the project area are considered low. The number of deer that were probably harvested in the project area is speculated to be less than six.

The Central Piedmont, with 552,156 acres, reported 92 gobblers harvested during the 1973 spring season compared to 72 gobblers harvested in 1972. Very few, if any, were probably harvested in the project area. The area of Frees Creek and the Broad River is believed to be good to excellent turkey range within the Central Piedmont according to a South Carolina Wildlife Resources Department District Biologist. However, the seasonal abundance of the wild turkey in the Frees Creek area and/or the Central Piedmont Hunt Unit has not been estimated. Turkey that presently occur within the Frees Creek area are "spillover", from adjacent U.S. National Forest Land where re-introduction of turkey took place during 1953-1956. This "spillover" is fairly recent and accounts for occasional sightings of single turkeys as well as small flocks in the project area.

Although there is potential non-consumptive recreational use of wildlife on project lands, it has not been realized. The major reason appears to be that this area is not unique within the Piedmont. New transmission line right-ofways should enhance habitat for both consumptive and mon-consumptive wildlife, and, therefore, provide greater recreational use.

ADDENDA II, Page 29

Consumptive recreational use of equatic resources involves the catching of fish, frogs, turtles or invertebrates from Parr Reservoir, the Broad River within the zone to be immdated, and Frees Creek. Presently there are no quantitative data available to estimate fisherman use of the area. Observations by field crews have not revealed any heavy usage of Parr Reservoir either by boat or bank fishermen. Access is difficult at most places on the bank, and the muddy waters and better fishing in other lakes tends to limit the use of the reservoir. At no time were more than 10-20 fishermen seen in any day at the reservoir during the prime fishing seasons (spring, early summer and fall). During non-prime seasons, 0-10 fishermen utilized the reservoir. Consumptive use of Frees Creek aquatic life is not known but would have to be slight since is supports only small fish and the creek itself does not serve as a spawning area for larger fish. Presently little is known of the consumptive use of the Eroad River in the zone which will be inundated. The river as a whole, however, is not noted for good fishing.

Non-consumptive recreational use conception organisms would involve observation of fish and invertebrates informally during pionics or other outings or at specific times when unusual movements (spawning) or other activities of aquatic organisms make them especially interesting to the public. Based on observations during field sampling, these uses are very low to nonexistant in the site area. The turbid nature of the waters for much of the year, the relative lack of access to the water, the lack of use of the area as a pionicking or camping area, and the lack of interesting visible activities of aquatic life serve to make this area undesirable for non-consumptive uses. Department of Interior - pg. 5 (Environmental Impact Sect. 3.0)

· Comment: "Furthermore, there is no evidence to support the assumption that sport fishery populations will be increased by construction of this project."

Response: Increases or decreases in sport fish populations due to the project will be the net result of the magnitude of potential losses to the existing Parr Reservoir and the section of Broad River to be inundated, combined with potential gains from Monticello Reservoir and the smaller Recreation Reservoir.

> The following is based on a qualitative assessment of existing or likely production from the system before and after project implementation. It assumes there will be no net damage or benefit to fish stocks downstream of Parr Reservoir. The present productivity of Parr Reservoir is considered 1 and is used as a basis of comparison for other conditions. A quality factor is used to indicate the relative proportion of desirable sport fish being produced compared to the total fish productivity. Explanatory remarks follow.

Without Project

#### Productive Quality Sport Fish Productive Quality Sport Fish Boay of Water Acres Factor Factor Production Factor Factor Production 3000 Parr Reservoir 3/4 2250 1/2 1/2 750 1 6500 Monticello Reservoir -1/2 2438 3/4 300 Recreation Reservoir -1-1/2 450 TOTAL. 3638

Parr Reservoir - Current biological studies indicate that there are 9 species that can be considered sport species and approximately 75% of the biomass would be sport species (see standing crop estimates from semi-annual report). A 50% loss in productivity of Parr Reservoir is conservatively estimated to be due to plant operations, primarily the extreme water level fluctuations. These fluctuations are also expected to disfavor nest building centrarchids which constitute the greatest proportions of sport fish. Therefore, the quality factor is reduced to 1/2 with the project.

Monticello Reservoir - Productivity is expected to be low because of en-'trainment, heat effects, and water level fluctuations. Less effect on spawning centrarchids is expected than for the modified Parr Reservoir resulting in a quality factor the same as for the unmodified Parr Reservoir.

Recreation Lake - Because of near-constant water level and much greater clarity, productivity is assumed to be 50% higher than the existing Parr Reservoir. Also, this lake will be managed for sport species exclusively, resulting in a quality factor of 1.

# ADDENDA II, Pase 31

With Project

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The net result is that there will be 3623 units of sports fish production "with project" and only 2250 units "without project."

ADDENDA II, Page 32

Dept. of Interior - pg. 5 (Fish and Wildlife Sect 3.2)

#### 3.2 FISH AND WILDLIFE

Comment: "The imundation of 2,550 acres of bottomlands resulting from the enlargement of Parr Reservoir and about 3,000 acres of bottomlands and mixed pine-hardwoods by construction of Monticello Reservoir will result in significant losses of wildlife habitat and a severe reduction in the carrying capacity of area lands for most native wildlife species."

Response: A loss of wildlife habitat will occur. The relative abundance of game animals, however, is low on the project area. A common assumption is that the density of animal populations is representative of the carrying capacity of the land. If the assumption is correct, the low population levels of most native wildlife is an indication of a low carrying capacity of the project lands.

The removal of selected forest trees (pine and hardwood) through current lumbering activities will promote an increase in the understory plant diversity and density. This increase in woody and herbaceous vegetation is anticipated to result in an increase in carrying capacity of the project lands and surrounding area. Consequently, population levels of many native wildlife species are anticipated to gradually increase throughout the region. Since the carrying capacity of the project area is already low and an increase in the carrying capacity of the surrounding area is anticipated, it is expected that the existing carrying capacity of the entire area will not be significantly reduced.

SCE&G has prepared agreements with the South Carolina Wildlife Resources Department to develop a management program for seeding transmission line rights-of-way, construction areas no longer in use, temporary roads, lay-down, temporary parking, dam faces and spoil areas for the benefit of native wildlife.

ADDENDA II, Page 33

ALCONCEPTS

#### FIGH AND WILLIARD COURS 3.2 CONTRACT

Count:

"The in this to really of this habitat deployedien will be the dispersion of evilating populations to add cars had ereas. Contrary to distributions in the data's statement, there is little percibility that many of the displaced wildlife species will be aburded by the corregating horitat."

# isspense: As stated in the drift E15 (page 3-6)

"If these habitst and fool puck cing areas are floofed, the animals would migrate to adjacent land areas. This migratic would plote an added attain on the hubitst of the wildlife species resident in these areas, thirsty disturbing an emisting balanced scorysten. In space with populations below the computing especity of the land, these displaced species might be absorbed without having any significant import on resident species. On these lands becoming expressions are harvested by hunters, die from disease or starvation, or nove into areas where they can be sustained by the hebitat. The creation of the upper reservoir would involve the inumistion of approximately 5,800 acres of wildlife habitat. from which termestrial wildlife species would be similarly displaced."

The ability of the surrounding habitat to absorb native wildlife that disporte from the project area, however, has not been assessed. It is assumed that the quality of the habita in the surrounding area is similar to the quality of the habitat on the project area and does not presently support an abundant population of game and non-game anirals.

An increase in luthering activity on the project area and in the surrounding area will reduce the forests canopy and protote an increase in understory vegetation. Where deciduous shrubs and herbaceous vegetation increase, there will be an increase in carrying capacity for many native wildlife. A lag time of a few generations occurs from the time this increase in carrying capacity is produced to the time when the populations have increased to meet this new level. It is provible that the surrounding habitat will have reached a higher carrying capacity with low densities of wildlife when construction of the project is completed. When the project forces resident species to emigrate into the surrounding habitat, the habitat may be able to absorb them.

ADDEDEA II, Paga 34

#### FIGH & WEDDELA OFLE 3.2 COMPLETE

Corment: "It is well documented that bottomland hordwood areas are bertors of high energy assis likits that these areas provide dan sives and crosps cover for we impaid this species. For energies the best white-tailed door habitat is characterized by a diversity of vegetative types and are classes such as presently culst at the Farr and Monticello sites."

"The bottomband and mixed hardwood sites provid a majority of the foods (particularly winter browse) and escape cover for this species. It is biologically mimicaling to suggest that destrution of about 6,000 acres of these vegetative types will not severely destroast the area carrying capacity for this species. Straneby (1999), in a comparison of forest types, reported: (1) these is more and better data food in bottomlands that on upland; (2) South Caroline sottomlands support an estimated one deer par 13 acres while hobiolly pine-hardwood and lengles? pine supports one door per 30 to 50 acres and 78 acres, respectively. Therefore, bottomlands are three times as valuable as the higher elevation forest types for deer production."

Response:

(1) we agree that bottomient hardwood areas are generally centers of high energy assimilation.

(2) we agree that the best white-tailed deer babitat is characterized by a diversity of vegetative types and age classes but disagree that this habitat is characteristic of the project area (See response to wildlife habitat comment)

(3) Stranshy's statements are generally true, however, deer graduction in the project area is much low - than that stated because habitat suitable for browse and cover is lacking.

Since the area presently supports only a few desr, a severe iscrease in the crea's carrying capacity is not anticipated.

ADDECTDA II, Page 35

# <u>Co</u>. :

The side weak has fulled to recognize the affects of this proper 1 to valenfold y photocore in the project are . The desirvation of vertication and the daily with a well fluctuation in 2,550 taxes of bottomlands at the transformer of the potential preclude any significant waterfluct urype. Of purticular importance is the potential destruction of valuable next sizes for the wood duck, an input that readent with even for the wood duck, an input the factor is the factor in the wood that the takes like this factor in relative word for populations is the list of suitable next contains. This at this should also recognize the proposed inundation of App acres of U.S. Forege Service lands that have been proposed as a waterflow her we area, and the Dawking Wildlife Veregement insultant has been not and by the South Carolina Wildlife and Marine Resources Lepartment for about 13 years.

Response:

The following information was taken from pages 2.2. -25 to 2.1.5-30 of the Environmental Report:

"Vatorfoul have historically utilized the Front River as a nigrating flyncy and neuting area. Many species are reported as tracted ats. Divevel, only wood ducks avoidered resident species. The Druad duck for is the of the major wood duck production areas in the Fiedmant System."

"The decrease of vatorioul populations along the river in recent years had been abtributed to the decline of the sprioulrural practices in the bottonlanis. Although there are a few small farms, they do not supply goald field for the migrant flights."

"Because of the area's waterfowl potential, the South Carolins Wildlife Resources Department, in cooperation with the U.S. Forest Service, has isveloped a 'Waterfowl Management Flam for the Broad River Composite. The objective of the program is to meet the increasing public demand for waterfowl hunting and viewing by restoring waterfowl resource. In the area."

"The general geographic bourdary of the program is a 5-10 mile wide band bisected by the Broad River extending from the City of Lookhart south to the City of Dawkins. One major development of this program is located near Dawting on Terrible Creek. This project includes 123 acres of open fields, 293 acres of bot open and hardwoods, and 619 acres of lobbolly pine. The southern boundary subjects the northamiliaits of the site."

"According to preliminary data, the increased elevation of Titr Resenvois may fleel certain properties of the U.S. Forest Service located upstream near 5- mille Creck. Plens have been from for a waterfowl habitat area on fined to Creck and development is empoted scon. 2022G has this conjust with the U.S. Forest Service concerning the possible effects of the project on the development. Further discussions will be held as project planes we say 100000, and 00000 will composed with the U.S. Forest Service of a value for y flee land and age as found mainly agreeable."

ADDELITA II, FARA 32

1970 March March March Work

G-82 Surveying was not complain of a time the invitemmental length was whitten, therefore, the following most ment was under in Edition in

"The full pointial for milliption of anythers of wildle's resources will not be realized until driailed topographic courses and other origin details an completed; however, 2000 will eccurate with the State Will Eccurace Department, the V.G. Fish and Willippi courses, and the U.F. Correct Service to offset any underivable chieviers."

"Probably the most significant impact on the termestrial block will result from the immedation of approximately 2.550 scores of bettermants due to the enlargement of Parr Recentoria. These bettermants up and from the recent constitute an important food proinction area and corve as a primary food course for wildlife (primarily deer, turkey and will entry both on and beyond the 2,550 acres. As a result, the loss of this food source will effect the table life recourses in the surrounding locale. As these food source coess becauunavailable, the motile forms will effect to different amers. This migration of displaced wildlife will place a new stress on these invaded extra and ifsturb their dynamic equilibrium." (FR, page 2.85-20) **MELTING MELTING** 

The Broad River and its tributantes provide very good wood fuck habitat for wintering and staging. NeGalvrey (1963) describes such helitat as any fooded timber or shrub ages that affect a viribility of the surpornlings. Tree cavities that may be potential nest sites are numerous near the Broal River.

The present major limiting factor controlling wood duck populations within the project real appears to be the low quality brood meaning habitus which is below optimum as described by McGilvrey (1965). A few peris in the Eroad River Floodplain and some shrub covered shoreline along the tributaries provide the limited amount of suitable brood meaning, habitat.

The inundation of 2,550 sores of bottomlands adjacent to Parr Reservit will destroy some of the wood duck meeting sites and, therefore, as stated on pages 2.2.5-29 and 2.2.5-30 of the ER:

"A waterfowl habitat improvement plan will be carried out around both reservoirs as part of the total Land Management Plan. Standard techniques will be utilized to provide food and additional nesting areas."

ADDIDA II, Page 37

# D. of I. - pg. 9.



Comment: 5. Hermotistic Marrow - This section phones be review in view of provident contrast. The universitable advance configure could offer a of construction of open the rise this project will be ...., the immedation of neurly 15 mills of river and streets fich bublish, a refucilin in the carrying percent of existing Parr Rece wir and a possible relation in provident of committeen fightries.

Response: The major unay loable adverse environmental effect on the squatie sysic: will not be the enlargement of Furr Recorrein, since iny surfed areas were found to suggers increased muchars of spour fished, but the uster-level fluctuations during operation of the purped storage freility. This vater fluctuation is excepted to reduce the fich carrying capacity of Parr Depertoir by decreasing benthic production in the littored zone and reducing spawning succers, especially of centrarchilis. Since the same around of water coming into the reservoir will be dischared downstraw, minus loss from evaporation, and temperature changes below Pare Ing will be repligible, no reduction in productivity of downstream disheries is anticipated.

Taga 35

II.

#### D. of I. - Pg. 9

Comment: 6. Relationship Delvers Local and Short-Forn Bariron and 1 Usen and Maintenance and Enhancement of Long-Terma Partyonigity. In view of the present potential of project- inversible lands to suggest extensive consumptive and nonconsumptive fich and vildlife-out thet represtional estivities, vy itsagree that proje invlacentation will provide enlarged recreational avenue. Furthermore, the last contende in this section clould be deloted until data are presented to suggest the claim of a long-term improvement in sport fishery reserves.

Response: Presently, the project even provides little fish and vililifeoriented repressional activities because of its limited access and low fish and wildlife production as compared to other areas in this is bity. The proposed upper fishing incomiment should provide better sports fishing with easy at se, while increased un lossifier vertitation from lumbering accivities and revegetated transmission line right-of-ways will provide better and IN - diversified habitats for wildlife. Recoveringal areas for beating, swimming, hiking and pionicking will also be established.

<u>ADDICA II, Polo 39</u>

#### G-85

II FORD IN TO GREEP ON BRO AND SUPPORT OUT OF CALL OF CARLING, CONFORD

C) Econditry of Contreast - pg. 1-

<u>Correct</u>: Or ants by the college of the Louisten's Secretary of Correcte noter to a concern on or analyzations acceles (ciriped base and blueback houris ) in four-size an values

In this regard they commut that:

a) The agree out between SCUG and the South Careline Wildlife & Marine Resources Department al. 11 provide necessary flows for successful spawning of these species.

b) Studies should be implemented to monitor the spawning of there fish, and .

c) Studies should be done to determine the filling of altering flows during the symming coasen.

<u>Response</u>: Presently the only ansinonous species known to be in the waters of concean are the striped have and blueback herming. There are little data available of a schnösnes or distribution of the latter species, however, it is considered a desizable forage species for striped base.

a) Mastings have been hold with the South Carolina Wildlife & Marine Resources Dept. reporting the flows required. As repult, a memoranium of understanding between SORMS and the Department has been issued and is contained in the F.P.C report, Appendix A. pg. A-8 to A-11. Minimum flows that would be maintained are given in this memoranium as 1,000 CFS instantaneous and the natural inflow into the Record River as a daily average (less evaporation looses of 68 CFS or less) for the striped bass spawning period March-May. This agreement has appeared to be satisfactory to the Department for the maintenance of successful spawning of this important species.

b) There are no plans to monitor sproming of the striped bars. The spauning cocurs in the Congeree River up i the dam at Columbia, approximately 26 miles domestream from the site. Because of South Carolina Electric & Gas' commitments with respect to water flow from Pars Perservoir into the Bread River and since there would be an indignificant inducate in water temperature downstream of Parr Dom due to project operations (on the order of a few degrees F or less), little or no change in the spawning area downstream will occur.

PREERINE II, Page 40

c) Encode 19, as for the topic topic topic topic topic of the second state of the second state of the second state of the state of the second stat

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c) Presently no data exists to document what are flows that are "too high", the resulting in passage of striped bass eggs into the down stream reservoir from the Congaree River, or "too low", thus resulting in eggs dropping into river sediments. Until state or federal fisheries agencies establish what these flows are, there is little basis for flow modification agreements. Because of the concern of S.C.E.&G. with respect to the striped bass, the Company is committed to taking whatever measures, in cooperation with the South Carolina Wildlife and Marine Resources Department, are feasible, including alteration of flows beyond those agreed to, to assure that the striped bass spawning is not indengered.

:7 e. 1.1 G-87

SOUTH CAROLINA ELECTRIC & GAS COMPANY

COLUMBIA, SOUTH CAROLINA 29202

January 21, 1974

Mr. Kenneth F. Plumb, Secretary FEDERAL POWER COMMISSION 1425 K Street, N. W. Washington, D. C. 20426

> Re: SCE&G's Response to Comments by U. S. Forest Service on Amended Application for New License and Environmental Report for Project No. 1894 (Addenda III to SCE&G's October 18, 1973 Comments on FPC Draft Environmental Impact Statement)

Dear Mr. Plumb:

V. C. SUMMER

SCE&G has previously commented on the FPC Draft Environmental Impact Statement for Parr Hydroelectric Project (FPC Project No. 1894) in letters dated October 13, 1973; December 11, 1973 (Adcenda I); and January 9, 1974 (Addenda II).

In this letter we are responding to the December 20, 1973 comments of the U. S. Forest Service, received approximately one year late, on SCE&G's Amended Application for New License and Environmental Report for Project No. 1894. We feel that the comments of the Forest Service should have been made earlier in order to be of help to the FPC in preparing its Draft Environmental Impact Statement, but we are nevertheless responding to them in hope of assisting the FPC's preparation of the final Environmental Impact Statement for Project No. 1894.

Very truly yours,

V. C. Summer Senior Vice-President





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KLM:VCS:II

Attachment

RESPONSE TO USDA - FOREST SERVICE'S DECEMBER 20, 1973, REPLY TO FPC LETTER OF SEPTEMBER 15, 1972 RECUESTING COMMENTS ON SCE&G'S AMENDED APPLICATION FOR NEW LICENSE AND ENVIRONMENTAL REPORT FOR FPC PROJECT No. 1894.

### Comment

#### General

The written portions are too broad consisting of phrases such as the licensee will cooperate, will survey, will make plans, will study, etc. It is recommended that license provisions require a submission of firm and detailed plans to comply with the Commission's Regulations under the Federal Power Act, Section 4.41, Required Exhibits. These license provisions should also establish firm dates for the submission of the detailed plans and surveys.

Response

At the time SCE&G's Application for New License and Environmental Report for Project No. 1894 were prepared, preliminary surveys of land, wildlife, etc., had just begun and commitments made in the texts of the Application and Environmental Report were necessarily broad, SCE&G is in the process of completing necessary surveys and studies and fully intends to comply with FPC Regulations as to requirements for detailed Exhibits and plans. We have developed agreements with the USDA Soil Conservation Service, the USDA Forest Service, and the S. C. Department of Wildlife and Marine Resources which substantiate our intention to cooperate with these and other agencies.

ADDENDA III Poge 1

#### II. Comment

# Exhibits R & S

1. A detailed developments plan by stages for the 300 acre sub-

impoundment should be provided.

The size of the parking lot for the sub-impoundment is too small.
 A minimum of a 40-car lot should be considered.

4. Recommend that the entire area within the triangle bounded by State Route 215, relocated Route 99, and County Road 347 be considered for dedication to public recreation.

#### Response

The extent of SCE&G's present plans for recreation at the Parr Project can be seen in Exhibit R of the Amended Application for New License for Project No. 1894, filed July 26, 1972. SCE&G consulted with the FPC; the S.C. Department of Wildlife and Marine Resources; the S.C. Department of Parks, Recreation, and Tourism; the S.C. Pollution Control Authority; the S.C. Department of Health; the U.S. Bureau of Outdoor Recrection; the U.S. Forest Service; and other agencies during the preparation of Exhibit R, and we feel that the present plans are adequate for initial development of recreational resources at the project. SCE&G intends to provide recreational facilities to meet the demand in the project area in accordance with FPC recommendations following odd-year reviews of the recreational facilities. Viewpoints of other organizations such as the Fairfield County Recreation Commission will also be considered in planning any future recreational facilities at the Parr Project. ADDENTE + HI Pres 2

# 111. Comment

# Exhibits R & S

3. Recommend the construction of an additional sub-impoundment to be located with the National Forest boundary to serve as partial mitigation for the loss of habitat through inundation and disruption of the Broad River Waterfowl Management Plan.

# Response

SCE&G has held numerous meetings with the U. S. Forest Service, resulting in the signing of the attached agreements of October 11,1973, and December 17 and 18, 1973. The October 11 Agreement provides for SCE&G to pay for replanning of the Broad River Waterfow! Management Plan, to exchange Forest Service lands to be flooded with other lands, and to provide a minimum of 90 acres of subimpoundments in the form of Greentree Reservoirs. In doing these things, SCE&G has made a commitment to help preserve and better the area wildlife habitat.

ADDENIDA III Poge 3

### G-91



V. C. SUMMER

Mr. Kenneth F. Plumb, Secretary FEDERAL POWER COMMISSION 1425 K Street, N. W. Washington, D. C. 20426

> Re: SCE&G's Response to Comments by Others on FPC Draft Environmental Impact Statement-FPC Project No. 1894 – South Carolina Electric & Gas Company (Addenda IV to SCE&G's October 18, 1973 Comments on FPC Draft Environmental Impact Statement)

Dear Mr. Plumb:

South Carolina Electric & Gas Company has previously commented on the FPC Draft Environmental Impact Statement of September, 1973 for Parr Hydroelectric Project (FPC Project No. 1894) in letters dated October 18, 1973; December 11, 1973 (Addenda 1); January 9, 1974 (Addenda 11); and January 21, 1974 (Addenda 11).

In this letter we are considering the USDA Forest Service comments on the FPC Draft Environmental Impact Statement for Project No. 1894, received by the FPC Secretary's office on January 10, 1974. Our response to ten of the Forest Service comments is attached, and our response to the remaining comments will follow shortly.

Very truly yours,

V. C. Summer Senior Vice-President

KLM:VCS:II

Attachment



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Commission.

# RESPONSE TO USDA FOREST SERVICE COMMENTS ON FPC DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR 5 1 01 11 74 FPC PROJECT No. 1894 PART I

#### 1. Description of the Proposed Action

Comment: Poge 1-7, Figure 1-1

Project boundary line is not defined for most of the project area. Response: The project boundary line will be appropriately illustrated on all required FPC License Application Exhibits upon completion of field surveys. The project boundary line will be located consistant with regulations of the FPC and will include only that land necessary for maintenance and safe operation of the project and any other land deemed necessary by the FPC.

Comment: Page 1-37, Last Paragraph

South Carolina Electric and Gas Company's (licensee) Exhibit R makes no mention of a swimming area in the Monticello subimpoundment. Monticello Reservoir will have Class B water and will be unsuitable for swimming under existing State water quality criteria.

Page 1-38, First Paragraph

This Draft Environmental Statement states that "no bank fishing, primitive camping on islands or water contact sports would be allowed on the main body of Monticello reservoir, due to restricions by the South Carolina Pollution Control Authority." However, frequent reference is made to the recreational value of fishing,

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ADDENDA IV Poge 1 and particularly of primitive camping on islands.

Response: The potential swimming area is mentioned on pages 1, 2, and 3

of Exhibit R-4, Land Clearing Plan, in the Amended Application for New License for Project No. 1894. Swimming and other water contact sports, bank fishing, and primitive camping on islands are all activities which depend upon the water quality of Monticello Reservoir. Whether or not these activities are allowed will depend upon the quality of the water, as determined by the S. C. Department of Health and Environmental Control, after the reservoir is filled. In making plans for future recreational use, SCE&G has considered the possibility that these water-related activities might be allowed.

# 11. Description of Existing Environment

Comment: Page 2-27, Second Paragraph

The statement that no known rare or ende gered species occur within the project area is inaccurate. The presence of Southern Bald Eagles in the project area has been confirmed.

Response: One Southern Bald Eagle was spotted in the project area during a migration season, but there has been no evidence discovered of Southern Bold Eagle nests in the project area.

111. Environmental Impact of the Proposed Action

Comment: Page 3-5, First Paragraph

The licensee with the assistance of U.S. Geological Survey, is recolculating the area to be inundated by redeveloping Parr Reservoir.

ADDENDA IV Poge 2 The new National Forest area to be inundated will be approximately 300 acres.

Response: This area of National Forest lands to be inundated will be determined in a manner acceptable to the U.S. Forest Service and in accordance with procedures described in the Memorandum of Agreement between SCE&G and the Forest Service, dated October 11, 1973.

Comment: Page 3-5 Second Paragraph

The Southern Bald Eagle does occur within the project area. Response: See above response to comment on "Page 2–27, Second Paragraph".

IV. Fish and Wildlife

Comment: Page 3-34, Second Paragraph

What sort of provisions have been made to dispose of recreationgenerated wastes, particularly those wastes associated with primitive camping on islands?

Response: As indicated on pages R-7 and R-8 of Exhibit R of the Amended Application for New License for Project No. 1894, anchored trash disposal containers and pit-type sanitary facilities will be provided at all public recreation areas. SCE&G also states responsibility for maintaining the recreation areas in a manner consistant with all applicable State Pollution Control and Health Department requirements.

V. Staff Position on Matters Having Significant Environmental Impact

Comment: Section 9.1

Land Use

Page 9-1

ADDENDA IV Page 3 このたいでなどのことであったとうと

1. The Forest Service agrees with the proposed project boundaries for Monticello Reservoir, except to suggest that the entire area within the triangle bounded by State Route 215, relocated Route 99 and County Road 347 should be dedicated to public recreation. 2. The Forest Service is of the opinion that boundaries for Parr Reservoir should not be fixed until recalculation of the inundated area is accomplished. The eastern boundary of Parr Reservoir should be the Southern Railway track, except for places where inundation would go beyond the track. Raising Parr Reservoir will make lands between the railway and the reservoir commercially non-viable because of inundation patterns, ownership patterns, and access.

The Forest Service has recently negotiated a Memorandum of Agreement with licensee, in which land exchange is a major item. Adjustment of the Parr Project boundary to accomplish this exchange will be in the public interest and will be of benefit to both the project and the Sumter National Forest.

Response: The project boundary line will be located consistant with regulations of the FPC and will include only that land necessary for maintenance and safe operation of the project and any other land deemed necessary by the FPC. All National Forest lands to be inundated will be determined, and necessary land exchange with the Forest Service completed in accordance with the Memorandum of Agreement between SCE&G and the Forest Service signed October 11, 1973.

> ADDENDA IV Parie 4

Comment: Page 9-4, Last Sentence

Change "... inundate 236 acres of National Forest land" to "300 acres."

Response: See above response to comment on "Page 3-5, First Paragraph." Comment: Page 9-5

> The entire existing Parr Reservoir is a part of the Broad River Waterfow! Management Area. A management plan for that area was made in 1965 by the South Carolina Wildlife and Marine Resource Department, the U. S. Bureau of port Fisheries and Wildlife and the U. S. Forest Service.

Under that plan, a Greentree Reservoir was being developed when the Parr Project was made public. Development was suspended until after the Parr Project was in operation. The Memorandum of Agreement between the Forest Service and the licensee provides fo replanning the Broad River Waterfowl Management Unit.

> ADDENDA IV Page 5

Poge 9-7

The first 13 lines are repeated from the preceding page.

Response: SCE&G concurs with these comments.

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#### MEMORALIDIM OF AGREESENT

#### BETWEEN

The Forest Service, U.S. Department of Agriculture

And

The South Carolina Electric and Gas Company Concerning Parr Hydroelectric Project, F. P. C. No. 1894

The Agreement, made and entered into this <u>1134</u> day of <u>[[]]</u> 1973, by the South Carolina Electric and Gas Company, hereafter referred to as the Cooperator, and the Forest Service, USDA, hereafter referred to as Forest Service, under the authority of the Department of Agriculture Organic Act of 1862 (7 U.S.C. 2201), and the Act of June 30, 1914 (16 U.S.C 498), <u>is required by the Federal Power Commission</u>.

WHEREAS, it is the desire of South Carolina Electric and Gas Company and the Forest Service to work in harmony for the common purpose of developing, maintaining, and managing all of the available resources of the Parr Hydroelectric Project, F.P.C. No. 1894, in the best interests of the people of South Carolina and the United States.

Therefore, under this Agreement: I. THE COOPERATOR AGREES

A. To enter into one or more cooperative agreements with the Forest Service on the following items:

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1. The Cooperator will agree to make men and equipment available to suppress any non-operation fire which threatens National Forest Land on a reimbursable basis. All decisions as to the fire's status will be made by the Forest Service or the South Carolina State Commission of Forestry Fire Boss.

2. The Cooperator will agree to reinburse the Forest Service for all costs of suppressing fires on or endangering National Forest land and pay tangible damages resulting from fires on National Forest land when caused by the cooperator's operations.

3. The Cooperator will submit and follow a burning plan approved by the Forest Service and the State Comission of Forestry. The Plan will contain an agreement that the Cooperator will abide by all laws pertinent to burning. The Cooperator will request permission to burn from the Forest Service, Enoree Ranger District, Newberry, South Carolina, and the South Carolina State Commission of Forestry and will have a man controlling their fires at all times.

4. The Cooperator will agree to conduct cadastral surveying operations. Work may be done in either of two ways:

a. Work may be done by the Forest Service on a cooperative deposit basis. The Cooperator will make an initial advance deposit of \$5,500.00 and other additional deposits as needed. The unused portion of these deposits along with itemized statements for all charges to the deposits will be returned to the cooperator following completion of land exchange.

b. Work may be done by the Cooperator. If this is the case, the work must be done to Porest Service standards. The Forest Service will inspect this work. Any work not done to Forest Service standards will

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be resurveyed to standard. The Cooperator will pay for inspection by the Forest Service. An initial advanced deposit of \$500.00 will be required and other initial deposits as needed. The unused portion of these deposits, along with itemized statements for all charges to the deposits will be returned to the cooperator following completion of land exchange.

5. The Cooperator agrees to pay for replanning the Broad River Waterfowl Management Plan on a cooperative deposit basis with the Forest Service. The Cooperator will make an initial advance deposit of \$4,000.00 and additional deposits as needed.

6. Within one year of the completion and commercial operation of the initial phase of the project, and following the completion of the revised Broad River Waterfowl Management Plan, the Cooperator will construct a minimum of 90 acres of Greentree Reservoirs in one or more impoundments at a site or sites to be determined by a cooperative effort of S.C. Wildlife and Marine Resources Department, the Forest Service, and the Cooperator.

7. The Cooperator agrees to develop an erosion control plan for all National Forest lands disturbed during construction with the contracted assistance of the U.S. Soil Conservation Service. Final approval of this erosion control plan rests with the Forest Service.

B. To enter into a land exchange with the Forest Service. The Cooperateintends to clear all timber on lands to be inundated in accordance with the land clearing plan filed with the FPC, in which the Cooperator has stated that, to the extend possible, all marketable timber will be removed by the land owner or SCE&G from areas to be inundated. On Page 2.2.5-41 of the project environmental report, the Cooperator also states that the options it has with the present owners reserve to the owners the right to remove the present timber within a stated period of time.

C. To turn over to the Forest Service any private lands purchased for construction of Greentree Reservoirs and buffer zones when within the National Forest boundary, and to the South Carolina Wildlife and Marine Resources Department if outside the boundary.

D. To amend FFC License No. 1894 to include this Memorandum of Agreement.

E. To obtain individual Special Use Permits for each temporary road, access road, right-of-way, or other use of National Forest land. II. The Forest Service Agrees

A. To enter into one or more cooperative agreements with the cooperation on the following items:

To enter into fire suppression activities stated in items
 I A 1, 2 and 3.

2. To perform on a cooperative work basis, all cadastral surveying land line location, corner establishment, witness corner mounumentations, or to inspect Cooperator's work and to resurvey all unacceptable work on cooperative deposit basis.

3. To replan, as required, on a cooperative work basis with the S.C. Wildlife and Marine Resources Department and the Cooperator, the Broad River Waterfowl Management Plan.

 To develop an annual maintenance plan for Greentree Reservoirs in cooperation with the S.C. Wildlife and Marine Resources Department. 5. To perform annual maintenance of Greentree Reservoirs in accordance with Item II A 4 of this memorandum of agreement.

# G-100

6. To collect necessary data, design Greentree Reservoirs, and conduct water level surveys on a cooperative deposit basis in accordance with item I A 6 of this Memorandum of Agreement.

7. To cooperate in the development of an erosion control plan in accordance with item I A 7 of this Memorandum of Agreement. MANUTATION IN THE PARTY OF THE

B. To enter into exchange offer with the Cooperator.

C. To accept any private lands acquired by the Cooperator under Item I C of the Memorandum of Agreement.

III. 'IT IS JOINTLY AGREED

A. That both parties will name liaison officers designated by the Forest Service and South Carolina Electric & Gas Company.

B. That the Cooperator and the Forest Service agree to enter into a land exchange, subject to laws and regulations concerning both parties. The specific details of the exchange will be set forth in a separate exchange agreement. Greentree acreage and status will not enter into the exchange offer. The selected tracts (areas to be inundated) are generally the lands lying between the Southern Railroad and the left (east) bank of the Broad River. Acreages listed are estimated.

U. S. Tract 97 -55 acres.
 U. S. Tract 458 - 385 acres.
 U. S. Tract 478b - 14 acres
 U. S. Tract 478c - 21 acres
 U. S. Tract 148 - 15 acres.
 U. S. Tract 70 - 5 acres.
Acceptable offered tracts, generally on the right (west) bank of the Broad River, are those that fit into the National Forest Land Adjustment Plan. Priority tracts are:

Trudy Henderson Tract (Glymph Island): Newberry County,
Dead Epok 87, Page 44.

 Henderson Estate Tracts, Newberry County, Deedk Book 47, Page 33.

3. Kennedy Tracts, Newberry County, Deed Book 35; Page 148, Deed Ecok 90, Page 3, Deed Book 90, Page 4.

4. Bursinger Tract, Newberry County, Deed Dook 49, Page 235.

Bursinger Tract, Newberry County, Deed Book 42, Page 410.
Greentree Reservoir shall be defined as:

A reservoir which controls fall and winter water levels on oak flats fir the purpose of attracting ducks for shooting or overwintering. Generally, these cannot be managed as brood rearing habitat since flooding and draining requirements are opposed. However, wood ducks are yearlong residents in South Carolina and careful selection of possible greentree sites should take into account the need for permanent yearlong water. The Greentree Reservoir will be at least 30 acres and have at least three of the six following species present and in or near mast-bearing conditions: Water oak, willow oak, swamp white oak, black gum, cherry bark oak, and American beach. Water depth of the Greentree Reservoir must be at least 3 inches and no more than three feet, except in eristing channels.

D. No Member of, or Delegate to, Congress or Resident Commissioner shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this Agreement if made with a corporation for its general benefit. E. The United States shall not be liable for any damage incident to the performance of work under this agreement to any depositors or landowners who are parties to the Agreement, and all such depositors or landowners hereby expressly waive any and all claims against the United States of America for compensation for any less, damage, personal injury, or death occurring in consequence of the performance of this Agreement.

F. Nothing herein shall be construed as obligating the Forest Service to expend, or as involving the United States in any contract or other obligations for further payment of money in excess of appropriations authorized by law.

G. That this Memorandum of Agreement shall become effective when signed by both parties and shall continue in effect until supplemented or terminated at any time by mutual consent of both parties.

H. No contribution to the cooperative fund herein provided for shall entitle the cooperator to any share or interest in the said improvements or land other that the right to use the same under the regulations of the Forest Service. All improvements shall be and remain the property of the United States.

IN WITNESS WHEREOF, the parties hereto have executed this Memorandum of Agreement as of the date written previously. SOUTH CAROLINA ELECTRIC AND GAS COMPANY

BY C. C. S. DEPARTMENT OF AGRICULTURE FORUST SERVICE

TREMCIS MARION AND SUMTER MATICNAL FORMETS

CAUNAS. Jake T. Sugar Sugar

G-103

COOPERATIVE AGREENENT

G-104

## BETWEEN

Constant Shows THE SOUTH CAROLINA ELECTRIC AND GAS COMPANY

AND

THE FRANCIS MARION AND SUMTER NATIONAL FORESTS, U. S. D. A.

THIS COOPERATIVE AGREDHENT, made and entered into by and between the South Carolina Electric and Gas Company, hereinafter referred to as the Company and the Forest Service, U.S. Department of Agriculture, hereinafter referred to as the Forest Service, under the provisions of the Act of June 30, 1914 (16 USC 498).

#### WITNESSETH:

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WHEREAS, the Company is planning to conduct cadastral surveying on National Forest lands of the Emoree District of the Sumter National Forest necessary for developing the Parr Shoal Hydroelectric Project, F.P.C. 1894 and

WHEREAS, the Company desires to conduct such surveying in accordance with Forest Service standards and is willing to pay for the inspection WHEREAS, the Forest Service is willing to provide the Company with Forest Service cadastral surveying standards and a qualified employee for inspection

NOW THEREFOLE, the parties hereto agrees as follows:

A. The Company shall:

1. Make advance payments, as requested by the Forest Service in \$500.00 amounts to be deposited in the Porest Service cooperative work fund.

2. Advise the Forest Service ahead of time when they plan to work on National Fores land.

G-105

3. Perform cadastral surveying on National Forest lands according to Forest Service standards which are attached and made a part of this agreement.

4. Replace with witness corners all corners adjacent to project area boundary and which will be or may be inundated.

5. Provide the Forest Service with copies of field notes concerning these witness corners.

6. Provide the Forest Service with plats showing the location of the project area boundary on National Forest lands with tie-ins to property corners.

Provide the Forest Service with standard acceptable plats and survey descriptions of offerred and selected lands involved in the proposed exchange.
Survey, post and establish exterior land lines of offerred and selected tracts (if they are portions of National Forest tracts).

B. The Forest Servie shall:

1. Provide the Company with a copy of Forest Service cadastral surveying standards.

Provide the Company with steel pipe and aluminum caps for witness corners.
Provide the Company with posters and red paint for witness trees.

4. Provide the Company with survey notes, plats and other information when available concerning National Forest lands.

5. Provide inspection service to the Company and inform the Company whether work is satisfactory.

6. Refund any unexpended balances of funds so deposited by the Company over and above the cost of inspection.

C. It is Mutually Agreed and Understood By and Retween the Said Parties That: 1. No member of, or Delegate to, Congress or Resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.:

 Nothing herein shall be construed as obligating the Forest Service to expend or as involving the United States in any contract or other obligation for the future payment of money in excess of appropriations authorized by law.
Representatives for each party hereto will be designated in writing to coordinate the administration of this agreement.

4. This agreement shall become effective upon signing of both parties and receipt of cooperative deposit and shall continue in effect until supplemented or terminated at anytime by mutual consent of both parties.

5. This agreement is supplemental to the MEMORANDUM OF AGREEMENT between the South Carolina Electric and Gas Company and Forest Service dated October 11, 1971 and as such is subject to all provisions of that agreement. IN WITNESS WHEREOF, the parties hereto have executed this agreement as of

the last date writter, below:

17. 117 / 73

1. 12. 18/23

William & Allone

South Carolina Electric & Gas Company

Forest Supervisor, Francis Marion & Sunter National Forests

## SPECIFICATIONS FOR CONTRACT CADASTRAL SURVEYING

G-107

## DIVISION 100 - GENERAL SPECIFICATIONS

110 - Scope of Contract

a. Notifying adjoining landowners that survey will be conducted.

b. Researching of such records and field investigation as is necessary.

c. Identification, restoration, monumentation of land and/or property corners involved.

d. Accurate running of all random survey lines to connect, prove, or establish property corners.

e. Re-running or offsetting of random lines to locate the true property lines between the U. S. Forest Service and private lands.

. f. Placing intervisible hubs on the true line.

g. Blazing the property lines between Forest Service and private lands.

h. Fainting and posting the property lines between Forest Service and private lands.

j: Preparation of survey plat or plats at a scale of <u>if the tiples of survey</u> ginal to the Forest Service. original to the Forest Service.

k. Preparation of Form 7100-52, Corner Record, for each property corner.

1. Completion of corner registration certificates and/or plats.

m. Recording of certificates and/or plats in the county records, after. approval of the Contracting Officer's Representative.

120 - Description and Location (See attached map)



### 130 - Government Furnished Items (As applicable)

#### G-108

2. Blank field notebooks.

b. Corner or witness monuments, either iron pipes with brass or aluminum caps or precast concrete monuments with brass or aluminum tablets.

c. Blank corner registration certificates and corner cards.

d. Boundary signs #54-2 and 54-3 in states poverned by BLM surveys, and corner location posters.

e. Treated wood posts and/or metal posts.

f. Red paint, brushes and nails.

g. All records, tract plats, maps, descriptions, abstracts of title or previous surveys pertiment to the area involved that are in the possession of the Forest Service. These will be kept on file in the Forest Supervisor's Office or District Ranger's Office.

140 - Contractor Furnished Items (As applicable)

a, All labor, equipment, instruments, and tools necessary to accomplish the work.

b. Field maps and plats.

c. Records or expenses incidental thereto required to successfully complete this work.

## 150 - Definitions

151 - Property line - the true line, usually straight, between two established property corners, or between meander points on an irregular boundary (such as creeks, ridges, roads, irregular fences) between property corners. Property lines which follow the curve(s) of the center line or right-of-way line of engineered roads may be surveyed and/or described by complete curve data, chord traverse, or offsets with adequate ties to the property corners.

152 - Tie line - any line run between a corner not a part of the instant tract and/or a corner, meander point or collateral call of the instant tract for purpose of proving and/or locating specific details of the instant tract.

153 - Trial line - any straight (tangent) line run from a corner of the instant tract toward any succeeding corner of the instant tract on an assumed, estimated or approximate bearing for the purpose of computing the true bearing and distance, and (right angle) offsets from the trial line to the true line. 154 - Random line - a series of courses, beginning at an identified point, usually a proven corner, in the general direction of, and to a succeeding corner. I random line may be used in connection with either property or the lines. We is to be used for computational purposes and/of proving the location of property corners, or other record data, of the instant tract, or corner(s) or other record data on adjacent or nearby tracts.

## DIVISION 200 - TECHNICAL SPECIFICATIONS G-109

210 - Property Corners

## 211 - Restoration of existent, lost or obliterated corners:

(a) BLM States - The principles and practices as set forth in the Bureau of Land Management publication "Restoration of Lost or Obliterated Corners and Subdivision of Section" shall be the basic guide in corner work as well as applicable state laws.

(b) Netes and Bounds States - The "Manual of Practice for Land Surveying providing they are not less than requirements set forth in the following paragraphs, will govern. If no Manual is in force, state laws will govern.

<u>212 - L\_\_\_\_\_\_\_</u> torners - The survey of resurvey of any tract of land shall begin at, or be tied into, an original corner (GLO, grant, lot, survey or tract or any existing corner which has been previously proven or identified by the Contractor. The accuracy of the point of beginning and procurement of the original survey notes, plats, and/or descriptions or adjoining boundaries shall be the responsibility of the Contractor. The Forest Service will make available any notes, recovery notes or field books that are available.

213 - Monumentation - All corners involved in this contract shall be established or perpetuated, using the type of nonument provided. The blank caps or tablets are to be stamped as directed by the Contracting Officer and will include year, surveyor's registration number, and corner identification. (See Exhibit "A") The top of the monument shall extend about 4" above the top of the ground. Rocks, when evailable, will be piled around each corner and painted ref

214 - Witness Corners - When a corner falls within a road right-of-way or in a body of water and the monument cannot be placed in the road, two witness corners shall be set exactly on line, as nearly as possible to the true corner or as directed by the Contraction Officer. (See Exhibit "B") Each cap will be stamped "Wit. Cor.".

<u>215 - Bearing Trees</u> - Each property corner or witness corner shall be witnessed by at least three healthy bearing trees when available, 6" DBH or over two of which will be located on Government land. When possible and practical, the true corner will be witnessed. The original trees called for are to be checked, and new ones will be established when needed. All bearing trees will be base blaced at ground level into the wood and scribed BT facing the corner. Bearing trees to witness corners will be scribed WCBT. All distance measurement will be to center of the tree. Witness trees located on Government land will then have a red 6" band painted 61 above the ground. A 54-3, bearing tree sign, will be placed on each Forest Service bearing tree with the bearing and distance to the corner noted.

### 200 - Property Lines

221 - Precticar - The Contractor shall begin his work from a proven corner. Intervisible stand will be set on the measured trial or random line. The departure from the end of line to the true corner will be measured as a means of calculating the correct bearing and true length of the line, and therefore calculating the offset from each reference stake to the corrected line. A transit or other optical instrument will be used to measure angles and a chain or tapb of good quality will be used for measurements. Electronic measuring instruments may be used. Final distance will be converted to chains. All angular measurements will be in true bearings. The point of reference, known corners, solar or pelaris observations, triangulation stations, will be noted in the notebook. Agonic charts are not suitable for declination determination.

<u>222 - Offsetting from Random and/or Trial Lines</u> - True lines may be establ shed by offsetting from the random line. The true or final line will be re-run using the corrected bearings or located by offsetting from stakes on the random line. All distances will be measured horizontally. The method used will be noted in the field book. Intervisible stakes will be set flong the true property line so that at least 3 stakes will be visible at one time. THE SAME AND A DESCRIPTION OF A DESCRIPR

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The error of closure on a closed traverse will be at least 1:2,000, unless otherwise specified by state standards. When the survey is so that a closed traverse is not practicable, the contractor shall use methods of surveying commensurate to obtain this accuracy.

<u>223 - Clearing, Blazing, Posting and Painting of True Property Lines</u> -Only sufficient clearing as to permit line of sight will be done on all random lines. On the true line, in accordance with arrangements with adjoining propert; owners or applicable state laws, the boundary will be brushed for a distance of 3 links on each side tf the boundary line, unless it is defined by such features as roads, hedges, or streams. Whenever possible, shrubs and saplings will be trimmed with stems and tops left intact. No line trees are to be cut.

#### a. Blazes and Hacks

(1) <u>Blaze</u> - Blazes will be made into a cambium layer of tree not less than 4<sup>1</sup> above ground, and will be 2<sup>11</sup> to 4<sup>11</sup> wide and 5<sup>11</sup> to 8<sup>11</sup> long.

(2) <u>Hack</u> - A single horizontal cut made with the heel of an axe 4" above and below the blaze, penetrating the wood but not notched.

### b. Standards

(1) Line trees on boundary line will be face blazed only, on opposite sides of the tree, along the line. They will not be hacked.

. (2) Trees on Government side of line will be quarter blazed with hacks 4: to 5: above the ground. No trees beyond 5 links of the line will be blazed. All blazes are to be painted with red paint on the Government side of the line.

(3) Trees on private land will be face prozed 41 to 51 above the ground. No tree beyond 5 links of the line is to be blazed. Blazing and painting on private land are to be in accordance with prior arrangements with property owners.

(4) Sign 54-2, Froperty Boundary, will be placed on line on treated posts, metal posts, or line trees. Posts should be placed firmly, extending about 41 above ground.

#### G-110

G-111 An unmounted sign will be placed on line frees, with mails left protruding at least 1". Location of signs 54-2 will be:

(a) At each corner facing private land and bisecting the angle. .

(5) Intervisible along the line, but not to exceed 10 chains.

(c) At stream, trail, and road crossings, and at ridge tops.

Only wooden posts are to be used at road crossings. A line tree may be substituted for a post whenever its location along the line permits. • . . • 

In GLO states, a location poster will be placed on one of the Government witness trees. 

#### . . . . 230 - Notebooks - Plats - Corner Cards - Certificates

. . .

\_\_\_\_\_ A. Survey Notes - The surveyor shall keep an accurate and complete record. of his survey in a standard field notebook, such as, standard transit book or mining book, using a 4H pencil and making no erasures. Corrections will be made by lining out erroneous detail. The completed field notebooks shall be delivered to the COR together with the invoice for job, and shall become the. property of the Forest Service. If errors are found in field notebooks, the COR will return them to the contractor for correction at no expense to the Government. - Street Street

(1) Bearings and distances of all lines and the corrected bearings and distances of each such line will be shown in a progressive manner for all closed traverse surveys. Open traverse surveys will be adequately cross-. referenced to permit a clear interpretation of the work and will require the same stipulations as to recording.

(2) Each page of the surveyor's notebook will be numbered and the description of such work shall appear in an index, front of book, with reference to the page number.

(3) Surveyor will properly record his place of beginning, describing the means by which it was identified. If the corner has acceptance of the adjoining landowners and said owners were present or contacted, he will record such facts, with names, addresses and dates. State whether or not they concurred in the survey.

(4) Distances to all definite, reasonably permanent topographic or . cultural features which will assist in future identification of lines or corners shall also be recorded. Artificial objects which are material to identification will also be noted. Any enclosures or habitation which appear on the line of survey or on Government lands within contractor's scope of vision shall be recorded as to size, description, name of elaimant or occupant, on a suitable sketch shown on right hand page of surveyor's notebook, as they appear in relation to the course of the line. Distances from the beginning corner to such features, objects, or evidence of use or possession will be shown as a plus number of chains and offset distances in chains to the right of left.

, (5) Surveyor will also record all corners to adjoining property found along the line of survey; making references to the type and size of corner monument and the bearing and distance to witness trees, giving the species, size and markings of each tree. When corners are not evidenced by monument of any type, he should so state. Corners which are in conflict with the results of contractor's survey should also be recorded in a like manner. When the performance of contractor's survey results in the retracement of a previous survey, and the person making that survey is known, the contractor should make a record of same in notebook with the date of survey.

(6) Any additional necessary markings of contractor's survey will be described in detail and the date on which marking was done.

(7) State method of establishing the true meridian and give declination of date of survey. (Ey solar or polaris observations, USC and GS triangulation station or taken from line between two known points or corners).

(8) A small scale summary sketch is to be prepared in the notebook to the general area, the lines run, lines painted, corners set. Page number(s) of notes may be shown.

(9) Date each days work and record names of party members, instrument used and whatever information is considered pertinent.

(10) Surveyor's certificate - Immediately following the last page used in notebook, a proper statement of certification is to be made as to his work which is contained in the numbered pages of the book, as follows:

> State of \_\_\_\_\_ County of \_\_\_\_\_

I hereby certify that the survey covered by the foregoing notes was well and carefully done, the bearings and distances were actually measured, the corners established and witnessed, and the lines marked all as indicated by the notes.

Date

Signature

Title

## State Registration No.

B. <u>Plats</u> - A plat will be prepared showing true property lines actually run similar to Exhibits C, D, E, and G. Those lines that are old Forest Service lines or tie lines will be noted. The scal of Registered Surveyor will be affixed.

C. Corner Cards - Form 7100-52 - One original 7100-52 will be completed for each corner set by the contract surveyor. All information placed on the card will agree with information in the field books. These cards will be signed by the surveyor and then become the property of the Forest Service.

B. Corner Remistration Certificate - When requested, the contractor will complete a corner certificate for each corner. These will be recorded in the county courthouse by the contractor.

... contracts - Where adjoining landowners teroin ...

deny permission for marking and reacting lines, such lines and cases are to be reported in writing to the CGR. These lines shall be corrected lines staked ready for marking. If the case is settled prior to the completion of the contract, the contractor will mark the line. Otherwise, the contractor will be paid as if the line has been marked.

If during the survey any claim arises along any segment of a line, the contractor will survey such areas as directed by the COR, keeping full notes thereof and furnish a separate plat of the disputed line and the land involved to the Contracting Officer's Representative.

240 - Exhibits A through G (As Applicable)

DIVISION 300 - INSPECTION AND ACCEPTANCE

(Reference Article 7 of 6300-38, General Provisions)

DIVISION 400 - MEASUREMENT AND PAYMENTS

(Reference Article 9 of 6300-38, General Provisions)

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· · ·

G-115  $\bigcirc$ Ê Some examples for setting WITNESS CORNERS 63 when true position falls in Right-of-Hay, etc. Two (2) Witness Corners are to be set follows: 8 S ·.\* C First choice location Second choice location × Third choice location to be used ONLY if others are (mpossible. ÷ : . Rev. 10-15-68 C.E.



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## SOUTH CARGEINA ELECTRIC & GAS COMPANY

DUST OFFICE BOX 764 . CLUNDIA, SOUTH CAROLINA, 25002

V. C. SUMMER

February 12, 1974

Mr. Kolmeth F. Fluth, Secretary FEDERAL POWER COMMISSION 1425 Kisties, N. W. Washimon, D. C. 20126

> Re: SCE&G's Response to Comments by Others on FPC Draft Environmental Impact Statement — FPC Project No. 1894 — South Carolina Electric and Gas Company (Addenda V to SCE&G's October 18, 1973, Comments on FPC Draft Environmental Impact Statement.)

王朝時になる自然時期にたいたいた

## Decr ... . Flamb:

Lotin Carolina Lizatric & Gas Company has previously commented on the FPC D of Environmental Impact Statement of Suptember, 1973 for Parr Hydroelectric Environmental Impact Statement of Suptember, 1973 for Parr Hydroelectric Environmental Impact No. 1894) in letters dated October 18, 1973; Decentic E1, 1973 (Eadanda I); January 9, 1974 (Addenda II); January 21, 1974 (Addented III); and Formary 1, 1974 (Addenda IV).

In this latter we are completing our response, begun in Addenda IV, to the USDA Project Service comments on the FPC Draft Environmental Impact Statement for Project No. 1884, received by the FPC Secretary's office on Jan. 10, 1974.

Very truly yours,

V. C. Summer

OFFICIAL

10

Senior Vice-President

KL// LTE

Attack

Response to UNAN Frends A. S. Communication FRC D aft Environmental Might Materia Miller FRC Project No. 1594 — Roma H

<u>Comment 19, 101</u>: No reference is used on obtained work, for i manoury in the environmental supers. Since the facility will be using about i on the Broad river ony manoury present (now or later) may be can characted in the Pair and Atomfidello Impoundments. Since this element is readily depended to the methyl form which is assimilated and concentrated in animal fleshy a proceeded in the exists.

Response: Marcury latels in bottom sediments taken from the Good River Study area in Fed cury, 1972, are 2008, 2042, 2038, 2008, 2008, 2019 and 2023 part at transectory in rough Encoded welly (the Map of An Jos Study Included in Schuling Biotic Sur cylicbort for Context Jucations). At stational for a chained on mercury levels by the South Carolitin Water Follution Control Autority in the Scoul River are presented in response to Context IV (c).

The maratic concentrations indicated by these listing that the sum not considered to be potentially nazardous. Because the existing that tests rate has been present as potential population of heavy matchs, including matches, for many yous, the present levels of mercury found should be a graditation of durant levels in the sediments. This is bared on the following:

- a) Excharation rates for an earline existing levels will not sufficiently concentrate metal levels in the wat into coursions change in deposition rates. Rate of deposition is field to indimentation rates and is not exposed to include in Pan Deposition de lag providit peration.
- b) In the content of the constant of the and the second state of the second state o

area (1999) and a second s

A. 1461

1974 prior to any dredging activity. The parameters and frequency of sampling has been outlined in the response contained in Addenda II, pages 3-6, S.C.E. & G. letter to FPC 9 January, 1974.

<u>Comment [M (b)</u>: The licensee cites developments of Par Pond as indicators of thriving game fish population in a cooling reservoir. The fish in Par Pond at the Savannah River exhibit high concentrations of methyl mercury compounds. These compounds resulted in part from continued evaporation of Savannah River water.

Response: High concentrations of mercury in fish found at Par Pond are not expected to be found in fish in Parr and Monticello Reservoirs since the hydrologic conditions are not analogous. There will be a continuous external inflow of water into the Parr-Monticello Reservoir system. Furthermore, operation of the pumped storage project will result in a continual interchange and mixing of water between Parr and Monticello Reservoirs, thereby decreasing sedimentation that might otherwise occur. Sedimentation rates are the primary factor causing mercury accumulation in bottom sediments since the greatest portion of metals can be expected to be adsorbed to sediment particles. Evaporation is less of a factor. Since the sedimentation rate is not expected to increase in Parr Reservoir, no increase in mercury concentrations over the present low levels is anticipated. See response to Comment IV (d) regarding sedimentation in Monticello Reservoir. Also refer to response to Comment IV (a).

<u>Comment IV (c)</u>: Other heavy metals also affect pickt and animal life in an equatic environment. The lower forms of aquatic life (clarition) are extremely sensitive to chromium, regardless of valence. Lead concentrations are moderately high and may binded particular of smaller fich and plankton. Scatt Carolina Pollution Control Autority for pled the Drupp Lifetr at Form (Route 213) for heavy metals on December 2, 1271. The results are as follows:

> ADDENDA M Page 2

> > .

Chromium1.03CopperNorCadmiumNotLead34 mTotal mercury0.03

1.09 mg (1 Nor detectable Not detectable 34 mg/1 0.06 mg/1

Response: Several values reported in the commants are not correct. Lead listed as 34 mg/l is actually  $34 \mu \text{g/l}$ . Mercury given as 0.06 mg/l is actually  $0.1 \mu \text{g/l}$ . The data reported are not extensive; however, the values do not indicate a serious biological problem.

The following data are a summary of data collected by the South Carolina Pollution Control Authority beginning in 1960. (note values are in milligrams per liter not

micrograms per liter.)

Chromium	Above Reservoir*	Below Reservoir*
N =	- 5	5
mex =	48	1.09
min =	10	0.10
องอะบริด	23	0.36
Codmium		
N =	. 4	4
max =	0.10	0.10
min =	0.005	0.005
everage	0.059	0.056
Leod		
[·] =	. 4	5
	0.20	1.21
min =	0.10	0.034
overage	0.16	0.35
Copper		· · ·
1.1 ==	4	4
roax 1	0.05	0.70
r Constant	0.03	0.05
6.2.4 Q	0.03	0.55

ADDENDA V

Pron 3

Mercury N =	Above Reservoir <sup>*</sup> 4	Below Retervoir*
mox =	.0005	.0005
min =	.0002	0
averoge	.0004	.0003

\*Above reservoir station at crossing of South Carolina Highway #34 about 10 miles above Parr Reservoir.

\*Below Reservoir station at crossing of South Carolina Highway #213 with Bread River, about 0.7 miles downstream of Part Dum.

Contract IV (d): Monticello Reservoir will lore about 25 200 acreefues of water annually. Part Ratervoir will foce about 16, 100 acreefues care offer. This is def percent of the volume of Monticello Reservoir and 50 percent of the volume of Part Reservoir. The Reservoirs, Manticello in particular, will because repositables for heavy metals. Monticello Reservoir will accumulate that 4.2 for of intractry, 1 010 lbs of feed, and 37 tons of chromium annually. Accumulations in Part deservoir will be about 60 percent of those in Monticello Teservoirs.

Essponse: The water losses astimated for Monticello and the Astronomy have no necessary relationship to the deposition of any heavy mond to the reservoirs.

During an average onnual period, 157,000 dare/feet will llow through Parr

Reservoir; thus the average concentration of minerals due to evopoly-lion is only 10

percent. A similar analogy applies to Monticello Recovoir.

It is not stated on what basis the poundages of various lowary metals calculated are based. They should primarily be a function of sedimentation rate since the gravitast portion of metals can be expected to be adsorbed to such our proficies. Repaidings of this, however, the importance of deposition is calculated any all open in the biological and thilly.

there there is a sublitional consumption for the provident of the sublition

in sediment during operation as opposed to without curration, the concentration factor of any organisms injusting sodiments will remain the same. If the total amount of catin antation is increased, the total amount potentially available to organisms is potentially increased. In Parr Reservoir there is no indication that sedimentation will be increased significantly and there are indications there will be a net reduction in bottom organisms. In Monticello Reservoir, sodimentation will accur with or without plant operation, although an area for sedimentation will be present that did not exist before. No additional concentrating processes will be present in Monticello Reservoir and because of the deep water nature of the bottom, benthic production that could be expected to bring heavy metals into the food chain will be cathelimited.

Note: The water losses calculated in the U.S. Forest Service's comment are for equilibrium conditions. Higher losses are anticipated because of the heated discharge into Monticello Reservoir by the Nuclear Station.

<u>Comment IV (e)</u>: Radionuclides released into waterways will be accumulated in vegetation growing along these areas. Will these controlled (through dilution) releases remain benigh, or will the effects be passed on to the animal consumers in the local ecosystem—and ultimately to man, through deer, turkey and waterfowl? Response: Padionuclides released from any surface source may ultimately reach man through the food web pathway. It is therefore reasonable to predict that some stabilization of the radionuclides released into waterways from the Virgil C. Summer to the Statistical III be picked up by vegatation and animal life. The arubial is the control pathway of any unstitution and animal life. The

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result from this level of concentration.

The radiological solety factors for specifying maximum releases of radionuclides take into account the charactel and radiological characteristics for each radioelement and the biological characteristics (concentration factors) of biota that may internalize these elements. The concentration factors and pathways of radionuclides potentially released from the Summer Nucleur Station have been discussed in the PSAR, ER and AEC Final Environmental Statement for the Summer Nuclear Station. These length have all been approved as acceptably sofe by the conservative standards set by the U.S. Atomic Energy Contrission. In addition, a field templing pactrum for statishing distring radiological levels will be corried out two parts balls of the nuclear reactor. Subsequently, field radiological no diaring of dir, water and selected biota during plant operation will be performed to insulta compliance with the AEC standards.

## Comment V

Relationship between lost the instant term and remainder and maintenance and enhancement as long-to-security

The Drift Environment of Statement defines short feed environmental use as <u>ABAC provide</u> the opposition conjection conjection provides 40 years and the opposition of the opposition of the provide the state of the

Enclose the State of State of State Point State of State Point State Point State Point State State Point State Stat State S The Draft Environmental Statement do page 2.5-2 mentions contribution to "long-te.m" productivity of the computity from the project and on enhancement of long-term productivity of the lond and water resources in the site area. We fail to recognize how these benefits will be generated by the project and feel that the analysis should better describe and evaluate them.

HER STREET BELLEVILLE

Response: It is recognized that the flooding of forested land, particularly the hordwoods and associated wildlife habitat along. Parr Reservair and Fraes Creek, will represent an irratrievable commitment of resources. Forested land in Fairfield County represents approximately 80 percent (1967) of the total land area; the forested areas to be inundated by the proposed Monticello Reservair and enlargement of Parr Reservair will be less than three percent of the total forested [and in Fair-

The present sport fishing in the project area is considered to be relatively poor. Only one unimproved boat landing exists in the project area, at Campon's Creek. As part of the project, an approximately 300 care fishing subimpoundment will be creefed in the northernmost portion of Monticello Reservoir. The fishing lake will undergo only minimum fluctuations in water level, if et all, and will be stocked with bass, bream and croppie. A boat lounching ramp, together with parking spaces and senitory facilities, will be provided in the fishing area. This represents the first such facility of its kind in Fairfield County and is considered a long-term enhancement of water resources. More details the provided in page 31, Adapted 11 of SEFEG letter to FPC of 9 January, 1974.

boot leaded on samp will also be construction to Part Same our cost a social of a second of second of the second o

tigte and the amount of eastern and trapped in this is the terms

reconstituted familities such as additional boat landings, planta areas and comping sites way also be constructed in the future depending on recorditional demand. All such facilities would be accomplished in consultation with the Federal Power Commission as well as with the South Coroline Department of Parks, Recreation and Tourism, the South Caroline Witchife Department; the U.S. Buredu of Quidoor Recreation; the U.S. Forestry Service and other ogencies.

Withlife habitat, to some exicut, may be anhanced by project construction. For excepted, it is generally considered that the extensive growth of bushy vegetation on out-over land following logging of major forests is a factor in helping to increase deer provalation. Similarly, the added edge created by clearing a corridor through heavily wooded areas will permit greater sunlight benetration and favor the growth of low growing weeds and woody plants that are in partant food sources to central species. Selective plantings will be made in transmission line corridors as accreptible. A waterfowl hubitat improvement plan will be carried out around both reservairs. SCEAG, in an agreement with the South Carolina Wildlife and Marine Resources Deportment, is consulted to development of a green-tree reservoir site or sites. The Company is sponsoring exploration of archaeology sites on project lands. These efforts on the part of SUEEG not only help offset the loss of forest lands but are also considered to enhance in some respects the present land and water resources of the site area.

First to be forgotten are the bracfits of the proposed project to the general population of this area. To addition to excreption opportunities not new available in Fairfield County, ample, controp, while the visibility to the location population.

> ADDENDA V Pane 8

higher standard of living.

Forested lands last cannot be replaced by the project, but on balance it is felt that , the loss of last than three gracent of Fairfield County's forested area and associated wildlife heat of is a small place to pay for the increase in human enjoyment and quality of 100 - put will accure as a result of project development.

Standard's and set of the second monthly estimate of standard by the second set of the probability of fags from the tensor of the probability of fags from the tensor of and will error to a traffic headrd. The licensee's environmental report does a realized a traffic headrd. The licensee's environmental report does a realized and realized at any reasonable solutions. By sponse: The B-2 in the Applicant's Environmental lipport, which is attached, lists the fact matching frequency anticipated as a result of the Reservoir, for both steam at the fact of the fact water, dissipating a few feet inland of the shore-line. If the estimated that 10 percent of the steam facts move beyond the reservoir base the estimated that 10 percent, the frequency of such fact moving overland is about the steam fact moving overland is about the steam.

The island of the second second of the second second second with wisibility below the second second of the second second

- Ademinia Prance with bigsway

It is concluded that the interference of highway maffie by fog formed by the

Ģ-128

reservoir is not significant.

(1) Page 2581-4 Supplement No. 2, to the Environmental Report, Virgil C. Summar Nuclear Station

ADDENDA V Poge 19 TABUE D-2

MONTH	FOG FREQUENCY	NET FREQUENCY (%) ADVICTICS FOG	(%) INCREASE DUE TO: <u>STEAM FOG</u>
June, 196	5 –	**	<i>1.</i> <b>*</b>
July, 196	5 8.5	0	6.4
Aug., 196	5 –	× ×	**
Sep., 196	5 12.9	0	9.2
Oct., 196	5 9.3	0	11.7
Nov., 195	5 9.6	0.4	15.8
Dec., 196	5 6.9	3.6	12.9
Jan., 196	5 .19, <u>8</u>	2.0	7-6
Teb., 196	6 18.8	6.4	4.0
Mar., 196	б -	**	<b>*</b> *
Apr., 196	б -	**	**
May, 1966	12.9	0	5.6

PROJECTED IMPACT OF MONFICELL O RESEAUNTR ON FOG\* FREQUENCY

\*Defined by visibilities less than or equal to six miles.

\*\* Not computed.

DDENDA V Urge H

## G-129

G-130

<u>Contract: Pope  $\ell = 1, 2, 3$ </u>: Water losses are stated for the various cooling towar alternatives. These water losses should be compared with the water losses calculated for the proposed project. Fog potential of the proposed project and the non-spray cooling pond alternative should also be discussed.

Reliponse:

The evaporative icsues from an equilibrium (open water) pond, in the region of

1.1. Monticello Recorvoir, average about 42 to 45 inches per year. In the obsence

of mermal input to the Monticello Reservoir from its use as a cooling pond, this i

everyoir approximates on equilibrium paind. Its evaporative lasses from its 6,800

mores would be, therefore, about 23,800 to 25,200 dare feet par year.

e evaporative losses from the Monticello Reservoir serving both pump storage

and cooling functions are estimated at 70 cfs or 50,680 acre fect per year.

(Environmental Report, Parr Hydroelectric Project, FFC Project 1394, page 2.2.2-1

The difference in loss rates between the reservoir serving both purpostorage and calling functions and the reservoir as a pump storage facility only is the water consumption attributable to the cooling function. This value is 26,880 acre feet pur year.

The following table comparestifis water loss for the proposed project with the minimatives, whose consumption is reported in the Draft Environmental Impact stement, Parr Hydroelectric Project, prepared by the FPC.

<u>Ccollint adama</u> onicel Eta (colline indice) oral Drofe Tollint adams o Poad Contemptive Water Loss per Merry Alam Cart

> 27,725. 27,725.

Sec 2.2 Rg 5

# SUPPORTING ELEMENTS for the COMPREHENSIVE PLAN

SCEG-1

## LEXINGTON COUNTY SOUTH CAROLINA

1499

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## Introduction

Since the turn of the century, comprehensive plans in the United States have gone by a number of names such as city plan, development plan, urban plan, master plan, growth management plan, general plan, land use plan, and policy plan. Although the titles have changed, the basic intent has remained the same: to provide an official document adopted by the appropriate local government that serves as a guide for policy decisions relating to the physical development of the community.

This document is the latest in a long line of comprehensive plans that have been developed for the County of Lexington. The purpose and intent of the Lexington County Comprehensive Plan is to provide a vision and clear direction for the county as it grows and matures. In 1994 the General Assembly passed the South Carolina Local Government Comprehensive Planning Act, commonly known as the enabling act.

This legislation was designed to accomplish two objectives. First, it consolidates existing planning legislation found throughout the code into a single source document. Second, it updates the old law with modern anguage that considers current planning practices, tools, methodologies and procedures for local government planning. It states that all public agencies with active planning programs "must make their ordinances and plans conform with the provisions of the Act by May 3, 1999".

In order to accomplish this deadline, the staff of the Lexington County Planning and Development Commission began to update their comprehensive plan in 1997. The plan seeks to create a strong and vibrant Lexington County by encouraging orderly development while creating a healthy environment and a prosperous economy. By accomplishing new growth in areas that can sustain additional development, the plan endeavors to preserve resources and to build strong communities based on an efficient transportation system, protected environmental resources and a strong diversified economy. The plan's elements reflect the character of the county's residents, while the policies and implementation tools serve as guides to future land use and planning decisions.

The comprehensive plan provides a guide for decisionmaking by the Planning Commission and County Council concerning growth and development. While it is to be used by policy makers to guide their decisions, it is also a reference for the private sector in making informed investment decision.

There is a listing of planning Goals and Objectives for Lexington County. They come from a consolidation of all the previous policies adopted for the various planning areas of the County as well as the inclusion of new needs and issues which have arisen in recent years. These goals can be changed at any time through amendment of this ordinance. County Council may make changes in the implementation strategies listed beside each item at any regularly scheduled meeting with the Department of Planning and Development responsible for maintaining the current status of these strategies.

This document is the latest compilation of information relative to population, economic development, natural resources, cultural resources, community facilities, housing and land use. It is the responsibility of the Department of Planning and Development to keep this information as current as possible for use by County Council, the Planning Commission, all County departments, other public agencies, and the general public. This data is to help anyone in the public or private sector to make more informed decisions, to include investment decisions. To expedite and improve the access to this data, all information is to be maintained in a digital as well as paper format, with access over the internet utilized where possible.

## **Planning Process**

This comprehensive land use plan is the result of input from each of the municipalities and various other interested parties. The municipalities reviewed the various sections that dealt with their individual information and submitted amended data where they chose to do so. Each of the municipalities separately prepared a comprehensive plan under the same enabling act during this time. Where appropriate Lexington County data is compared or contrasted to other South Carolina counties. Obviously in a project of this size numerous sources were consulted for information. Several different staff persons were involved in selected portions of the work.

# NATURAL RESOURCE ELEMENT

## **Overview**

Lexington County lies across several physiographic regions in the central midlands of South Carolina. The northern part of the county is in the lower part of the Piedmont while the southern portion is on the Upper Coastal Plain. Between the two lies a zone of transition called either the Sand Hills or the Fall Line. The county contains approximately 450,000 acres of forested, agricultural, wetland, urban, or undeveloped land (S.C. Department of Natural Resources, 1990). Lake Murray, several rivers, and numerous ponds and streams cover an additional 37,000 acres of the county in patterns characteristic of the topography, soil type, and geologic features of the area. Prime farmlands and forests, supported by these streams and rivers, are found in soils best suited for agricultural needs. These natural resources provide a variety of plant and animal habitats.

## **Slope Characteristics**

The slope of an area is dependent upon location, soil type and geologic formations which underlie the area. Lexington County slopes are gentle to moderate, or 2-10 percent. Elevations range from 350 to 600 feet above sea level at the ridge tops. Valley elevations range from 110 to 300 feet above sea level. Along the rivers and creeks there are strong to moderately steep slopes of 10-25 percent according to the U.S. Department of Agriculture (USDA), 1976).

Areas with the most topographic change occur in the northern and western regions of the county around Lake Murray and the Saluda River. A plateau with an elevation around 500 feet extends in east-west ridges along U.S. Highway 1. Steeper slopes can be found close to streams in the northeastern portion of the county with a range from 2-15 percent.

Most of the Atlantic Coastal Plain slopes can be described as gently rolling to level with depressed areas in some places. The southern area of Lexington County is a plain which has slopes ranging from 0-6 percent on ridge tops and 6-10 percent on the side slopes. Areas of depressed land and broad flats occur around the Congaree-Taccoa-Brogdon soil associations in the eastern central region.

## **Prime Agricultural and Forest Land**

Prime farmland is defined as land which is "best suited for producing food, feed, forage, fiber, and oilseed crops" (USDA, 1984). In 1984, Lexington County had 61,643 acres of prime farmland. This is 13 percent of the total land area. Agricultural acreage has decreased in recent years due to urban expansion in the county. Prime farmlands, comprised mostly of crop lands, forest lands, and pasture lands, are found predominately in the Piedmont Plateau of northern Lexington County. Peach orchards are also found in the west-central area of the county. Also, some prime farmlands exist in eastern areas outside th urban regions of West Columbia and along the Congaree River. Between SC Highway 302 and the area east of Swansea, scattered prime farmland can be found. Additional farmland is found throughout Lexington County along streams, creeks, and other water bodies. Additional farmlands are of statewide importance. However, they exhibit some properties such as seasonal wetness, irritability, limiting root zone, flooding, or doughtiness, which exclude them from being prime (USDA, 1984). Forest lands, which accounts for 38.5 percent of the prime farmlands, accounts for more than 50 percent of Lexington County's total land area. Various assortments of pine, oak, cypress, elm and cottonwoods grow in locations of suitable soils and slopes. Lexington County found that 43,000 acres of forest land is in need of management assistance and reforestation (Lexington County, 1990). A study done by the USDA and Forest Service found that of the 246,892 acres of timberland in Lexington County, 4.8 percent is planted in pines, 30.9 percent is natural pine, 18.7 percent is oak-pine, 37.5 percent is upland hardwood, and 8.2 percent bottomland hardwood (Tansey and Hutchins, 1988).

## Piedmont Plateau Province

There are two distinct soil regions of the Piedmont Plateau which have prime farmlands. The Georgeville-Nason soil association is located in the extreme northern portion of the county and the Cecil-Appling association is located between the Georgeville-Nason and the Fall Line. Both of these are gently to strongly sloping well-drained soils which contain silts. They are underlain by slate and granite, respectively. These soils meet the criteria set by the USDA-Soil Conservation Service for soils to support prime farmlands (USDA, 1976).

The Georgeville soils have a sandy loam to a very fine sandy loam or silt loam surface layer and clay, clay loam, silty clay or silty clay loam subsoil. These sediments allow for moderate permeability and medium to high available water capacity. With a slope of two to 6 percent, runoff is medium and tilth is good. However, erosion is a major management concern. With increasing slopes, these soils are more suitable to woodlands rather than cultivated crops, hay, and pasture which can be found in lower relief areas. The Nason series, much like the Georgeville soils, has sand, silt, and loam consistency, moderate permeability, and high available water capacity. Minor soils such as Tatum and Helena soils contribute to the agriculture and forest land productivity. In areas where slope is less than 6 percent, the soil is used for hay and grasses, pine trees, and orchards. Corn, cotton, soybeans, small grains, and vegetables can be grown. However, runoff is rapid and erosion can be a management problem. With increased slopes, these soils are mostly wooded (USDA, 1976). An analysis using Land Use/Land Cover data and STATSGO soils data show that the Tatum-Georgeville-Herndon and Georgeville-Herndon-Helena soils together hold 7.2 percent of Lexington's agricultural land and 6.6 percent of the forest land.

The Cecil-Appling soil association is found in an eastwest band reaching across Lexington County just south of Lake Murray and is an important soil for prime farmlands. Pacolet and Helena soils are also found in the area. The Cecil Series, weathered from granite rock, has a surface layer of sandy loam or silt loam and a subsoil of clay, clayey loam, silty clay, or silty clay loam. Permeability is moderate and available water capacity is medium. Soils that have slopes of 10 percent or less can support crops such as corn, small grains, peaches, vegetables, hays, pastures, and soybeans. However, a higher slope creates more runoff and erosion becomes a greater concern. In areas where slope is greater than 10 percent, usually on side slopes near drainage features, most of the land is wooded. Erosion is most severe in cleared areas. The Appling soil series are similar in sediment content to the Cecil Series. Permeability is moderate and available water capacity is medium. Soils found on simple ridge tops and hill slopes, 2-6 percent, have a moderate erosion hazard with medium runoff. Good tilth makes this soil more suitable for prime farmland. Main crops include corn, cotton, soybeans, small grains, peaches, hay, and pasture. Steeper slopes afford more severe erosion which in turn makes the soil better suited to woodland cover with some acreage for hay and pasture (USDA, 1976). The Pacolet-Cecil-Helena associations hold 6 percent of Lexington's agriculture and 10 percent of all woodlands.

Both the Georgeville-Nason and Cecil-Appling soil associations have a moderately high productivity for broadleaf and needle leaf trees in Lexington's Piedmont Plateau. These soils impose no significant limitation for woodland growth. In general, Lexington's forests are predominately evergreen where 92.8 percent of all forest land is softwood. Loblolly pine, Red oak, Shortleaf pine, Virginia pine, White oak, and Yellow Poplar are commercially important trees of this region. They have a site index, or average height, between 70 and 90 feet for dominant trees. Loblolly, Slash, and Virginia pines and Yellow Poplar are all suitable for planting in these soils (USDA, 1976).

Prime farmlands of the Coastal Plain Province are situated in the southern areas near Swansea, and south of Cayce and West Columbia, adjacent to the Congaree River. Scattered prime farmlands around the town of Swansea overlie the Dothan-Troupe-Fuquay soil association and some Vaucluse soils. The concentrated area along the Congaree River is closely associated with the Congaree-Taccoa-Brogden soil association. Both of these nearly level associations are well-drained, loamy soils. However, some soils are limited in productivity because they are shallow, droughty and/or stony.

The Dothan and Fuquay Series of soils are similar in that permeability of water is rapid in the surface layers, moderate in subsurface sediments and slow in the lower subsoils because of a plinthite layer which decreases the rate of downward movement of water and root penetration. Their available water capacity is medium. Dothan soils with a slope of zero to 2 percent have slow runoff and good tilth which allow almost all of this acreage to be cultivated. Main crops include soybeans, cotton, small grains, peaches, and corn. The primary hay and pasture grasses include Bahia grass, coastal Bermuda
## MAP OF MAJOR SOIL CLASSIFICATIONS

grass, and Sericea lespedeza. Problems associated with this soil is mortality of crops when a high water table is present. With increased slopes, this soil is still suitable for main crop and pasture cultivation; however, erosion could be a problem. The Fuquay series soils, with zero to 6 percent slopes, generally have the same characteristics of the Dothan soils. However, these are sometimes droughty and subject to soil blowing and nutrient leaching. Troupe Series soils, formed in loamy marine sediments have decreasing permeability through the surface layer to the subsoils. The sandy top layers allow for little available water capacity. They are droughty and nutrients are leached from them rapidly. With fertilization and proper management, these soils can be used for soybeans, corn and cotton (USDA, 1976). With the Vaucluse soils, the Dothan and Fuquay soils hold 18 percent of Lexington's agriculture lands and 9 percent of the forest lands.

The Dothan soils have a high potential for productivity of needle leaf trees such as Loblolly, Longleaf, and Slash pines. The site index for dominant trees ranges from 70 to 90 feet. The Fuquay and Troupe Series soils have moderately high potential for productivity of Loblolly, Longleaf, and Slash pines with a site index between 60-80 feet. Forest production is generally limited to Loblolly and Slash pines because of mortality of saplings when there is a high water table.

On the flood plains of the Congaree River about 40 percent of the Congaree-Taccoa-Brogden soil association is used for farming. The remaining is wooded or idle. These sediments are made of loamy alluvium on stream terraces. The Congaree Series contains surface layers of fine sandy loam or silt loam and subsurface stratified layers of sandy loam, silt loam, and sandy clay loam. Permeability is moderate through these sediments and water capacity is medium. Runoff is slow for this soil which allows for annual flooding for short periods. Most of the land associated with this soil is wooded although large cultivated areas have com and soybean. The Taccoa Series is very similar to the Congaree Series in sediment consistency and propensity to flood. Permeability is moderately rapid, water capacity is low, and runoff is slow for these soils. Unlike the Congaree, most of this soil is planted with corn and soybeans or pasture. A small amount is wooded. The Brogden Series soils, with zero to 2 percent slopes, consist of loamy sands and sandy loams. Permeability is moderately rapid and available water capacity is medium. In dry periods, this soil may become droughty, however it can be cultivated soon after rain. Runoff is slow and tilth is good for pasture and crops; however, only 0.1 percent of all agricultural land is used on these soils mostly due to the small land area which these soils encompass.

The soils along the Congaree River also provide a habitat for many different types of trees. Congaree and Tacca soils have a very high potential for productivity of Black Cherry, Black Walnut, Cottonwood, Green ash, Loblolly pine, Shortleaf pine, Sugarberry, Sweet gum, Sycamore, Water oak, and Yellow poplar. The site index for dominant trees of this group range from 90 to 110 feet. There are no significant limitations on growth and management of woodland in these soils. The Brogden Series has a high potential for productivity in Longleaf, Loblolly, and Slash pines with a site index between 70 and 90 feet (USDA, 1976).

#### Plant and Annimal Habitats

Plant and animal habitats of Lexington County identified by the National Heritage Program (NHP) can be grouped according to regions. Most of the plant and animal species found in the survey live in a level to strongly sloping environment of the Coastal Plain. Lakeland-Blaney soils which traverse the entire east to west width of Lexington provide the basis for evergreen and mixed forest, pasture, and wetland habitats. Animals such as the Eastern fox squirrel, the Eastern coral snake, and the Black swamp snake make their home in the pine and oak forests and swamp lands of the area. Bald eagles, listed as an endangered species, are found in areas below Lake Murray and along the border with Richland County. Both of these areas offer access to the Saluda and Congaree rivers. The Carolina Darter has also been identified in a survey conducted along the northern border with Richland County. The habitat of this threatened fish includes areas of the Santee River drainage system, backwater pools near banks of small, slow streams with silt or detrituscovered bottoms. The Red-cockade woodpecker, on the federal endangered list, has also been identified in Lexington County and can be found in mature pine stands.

Schewinitz's sunflower, listed as an endangered species, has been surveyed in lower Lexington in open or sparsely wooded areas on Iredell soils. The most complex mixtures of plants lie in the central areas of Lakeland Blaney soils. The following vascular plants thrive in habitats of dry open sandy woods with sparse ground cover, and flood plains of blackwater streams: Sweet pitcher plant, Pickering's morning glory, Woody goldenrod, and Woollyberry.

#### Water Resources and Wetlands

#### **Overview**

The hydrologic regime of Lexington County is dominated by the Saluda, Broad, Edisto, and Congaree River basins. The Saluda, Broad, and Congaree basins are part of the larger Santee River Basin and the Edisto is one of the three sub-basins that makeup the ACE River Basin formed by the Ashepoo, Combahee, and Edisto Rivers (S.C. Water Resources Commission, 1993). Numerous streams cut throughout the county in dendritic patterns to feed the main river stems. Stream flow in the Piedmont Province is dependent on rainfall and storm water runoff. Because channels are not deeply incised in the terrain, there is less opportunity for them to intercept fracture zones which would support a groundwater base flow. Upper Coastal Plain streams of Lexington County are deeply cut into the porous sediment. As a result, shallow water aquifers are formed above stream level and release directly into stream beds to support a wellsustained water flow. Because the shallow aquifers absorb great quantities of water, runoff is minimal. Therefore, stream flow is maintained primarily from groundwater storage and base flow.

All major rivers and creeks of Lexington County, except the Saluda River from the Lake Murray Dam to the confluence with the Broad River, are classified as Freshwater (FW) (Department of Health and Environmental Control, 1993). These waters are suitable for swimming, fishing, and other contact recreation as well as a public water supply source after conventional treatment. The exception is that the Saluda River is classified as TPGT, Trout Put, Grow, and Take water. This is freshwater suitable "for supporting reproducing trout populations and a cold water balanced indigenous aquatic community of fauna and flora," as well as those activities of class FW (Department of Health and Environmental Control, 1993: 19).

Wetlands are "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances for support, a prevalence of vegetation typically adapted for life in saturated soil conditions" and "generally include swamps, marshes, bogs, and similar areas " (Vismor and Associates, 1992: 39). Approximately 19 percent of Lexington County has hydrology, soil, and vegetation conditions which qualify as wetlands. Of these 54.1

percent are bottomland hardwoods, 14.4 percent are deciduous forested, and 31.5 percent are coniferous forested wetlands (Appendix B).

#### Saluda River Basin

The Saluda River found in the Piedmont of Lexington County has a stream flow modified by the water discharges from Lake Murray. From Newberry and Saluda Counties the Saluda River flows through Lake Murray until it converges with the Broad River to form the Congaree River. Below Lake Murray, the Saluda has been found to average an annual stream flow of 2,929 cubic feet per second (CFS) near Columbia. Generally flow is greater than 430 cfs.

In the smaller streams and tributaries, the flow is more variable because they are affected by smaller watersheds. Decreased groundwater support and average precipitation in southern Piedmont regions also have a variable affect on stream flow. Lake Murray, constructed in 1930, has the fifth largest surface area and the third largest volume of all the water bodies in the state. Located primarily in northern Lexington County, it is used for hydroelectric power, recreation, and water supply. Classified as mesotrophic, or having moderate to high nutrient levels, Lake Murray has generally a good and improving water quality. However, some problem areas occur in the upper reaches of the lake and in small coves where point and non-point source pollution enters from the upper Saluda and its tributaries.

Groundwater in the northern portion of the Saluda River basin provides Lexington County with a public water supply source. Two zones, the Shallow Sedimentary Rock Aquifer, and the Crystalline Rock Aquifer have been utilized for this purpose. Shallow wells, 60-100 feet deep tap groundwater at the saprolite layer of sediment. The permeability of this layer decreases lower in the Piedmont Province which in turn decreases rain water infiltration. As a result, these wells are apt to run dry. The Shallow Sedimentary Rock Aquifer is used by Lexington County only as a secondary source for public water supply due to limited availability compared to other sources found in the Coastal Plain Province. The Crystalline Rock Aquifer is composed of fractured igneous and metamorphic rock This deeper bedrock aquifer provides higher yields in faulted or jointed areas. All aquifers are recharged directly by precipitation or indirectly by groundwater storage in the saprolite layer. Around the Leesville area, the Tertiary Sand Aquifer System is a source of public water supply.

Wells in this aquifer yield 50-150 gallons per minute. However, these ground waters have been found to contain concentrations of Radium-226 which exceed safe drinking water standards. Radium-226, which is formed by the radioactive decay of thorium, is thought to have originated in the granitic outcrop areas near the Fall Line. Groundwater obtained from other sources of the Saluda River basin in Lexington is generally found to have good water quality (S.C. Water Resources Commission, 1983).

Wetlands in the Saluda River basin are minimal due to soil type and topography. Appling, Tatum, Georgeville, and Lakeland soils contribute to an average slope of 7 percent in various watersheds of the basin. Scattered wetlands are found around Lake Murray and Twelve Mile and Hollow Creeks (S.C. Water Resources Commission, 1995).

The northern Piedmont Province holds about 18 percent of Lexington's wetlands. Mostly bottomland hardwoods, the wetlands of the Tatum-Georgeville-Helena soils mixed with some Nason and Herndon soils are primarily deciduous hardwood trees occurring in swamps or other partially or occasionally inundated environments (Appendix B).

#### **Broad River Basin**

The Lexington-Richland County line near Chapin lies in the southern fringes of the Broad River basin. Streams that originate in this area exhibit low flows. Only 0.2 percent of Lexington's population is within this sub-basin and water supply from it is close to zero.

#### **Congaree River Basin**

The Congaree River basin consists of the Congaree River and its tributaries below the convergence of the Saluda and Broad Rivers. Stream flow near Columbia is very stable. Average annual stream flow is 9,425 cfs. This uniform, well-sustained flow provides a good water supply for Lexington County. Water quality of the Congaree River is generally good with exceptions arising as a result of municipal point source discharges and urban runoff (S.C. Water Resources Commission, 1983).

The Middendorf Aquifer System lies under the entire Congaree River basin. The Tertiary Sands Aquifer System overlies the Middendorf in the northern reaches while Black Mingo Aquifer System overlies it in the south. The stable water supply of the Middendorf provides acidic, soft water, low in fluoride and chloride for this basin. In some isolated wells in the Cayce and West Columbia areas, acceptable drinking water standards for naturally occurring radiation are exceeded (S.C. Water Resources Commission, 1983).

Approximately 18 percent of the land area of the Congaree Basin in Lexington County is forested wetland. Wetlands are also found in the Congaree Creek and Sandy Run areas (S.C. Water Resources Commission, 1995).

#### **Edisto River Basin**

In the western region of Lexington County, adjacent to Aiken and Saluda Counties, the Chinquapin and Lightwood Knot Creeks converge to form the North Fork Edisto River in the Edisto River Sub-basin. Black Creek and Bull Swamp Creek contribute to the North Fork Edisto further south, flowing in a southeasterly direction. Stream flow in these waters is well-sustained. Historical analysis has indicated declining concentrations of total phosphorus and biochemical oxygen demand as a result of pollution control programs. The total phosphorus concentration exceeded EPA criteria of 0.1 mg/l and violated state standards for fecal coliform bacteria as a result of livestock and feedlot activity. Also, the nitrogen/phosphorus (N/ P) ratio was lowest in the Edisto basin because of the excess phosphorus entering streams from point and nonpoint sources. A high N/P ratio is an indicator of a balanced aquatic ecosystem and an undisturbed watershed (S.C. Water Resources Commission, 1993).

In the Edisto River basin, near the North Fork Edisto River, there is a variable groundwater supply for Lexington County. Near the Fall Line, crystalline rock aquifers produce low yields, whereas further south, the Middendorf, Tertiary Sands, and Black Mingo Aquifer Systems are more utilized for public supply. The Middendorf and Tertiary Sand aquifers are the preferred systems of Lexington County primarily because of the large yields of available water. The Black Mingo is only partly in Lexington and is a secondary source. Sediments of the Middendorf Aquifer System lie near the surface of Lexington County and groundwater movement through the system is to the south and southeast. It produces soft, acidic water, very low in dissolved solids, which makes it corrosive to metal surfaces. The Tertiary Sand Aquifer System is composed of highly permeable quartzose sands with sandy clays and inter-fingered limestones. Direct precipitation recharges this aquifer in the outcrop areas adjacent to Orangeburg County. Water quality is acidic, high in iron and low in dissolved solids. Some wells in this

## HYDROLOGIC MAP

area may contain hydrogen sulfide gas. Natural radioactivity, in excess of safe drinking water standards, occurs in isolated areas of the Edisto River basin. The Black Mingo Aquifer System is composed of fine sand, silty clays, fullers' earth fossiliferous limestones, and some mixed shales (S.C. Water Resources Commission, 1993).

Wetlands of the Edisto River basin are concentrated along the larger water bodies such as the North Fork Edisto River, Black Creek and Bull Swamp Creek. Generally, the total percentage of wetlands in a watershed of the Edisto basin increases toward the southeastern areas of Lexington. The North Fork Edisto watershed, from its origin to Black Creek has the highest percentage of wetlands, approximately 8 percent, and these are classified as forested wetland (Department of Health and Environmental Control, 1995).

The entire Coastal Plain region has many soils which can be classified as wetlands. The large Lakeland Blaney soil association along with some Fuquay soils holds 46 percent of Lexington's total wetland area. Most of this acreage is bottomland hardwood along streams or rivers. Twenty-four (24) percent of all wetlands is held in Lakeland, Fuquay, Alga, Dothan, and Vaucluse soils located in the southern areas of the county.

#### Soils

Lexington County is situated on two distinct physiographic regions. One fourth of its total surface area is on the Piedmont Plateau while three-fourths is on the Atlantic Coastal Plain. In general, the southern Piedmont has gently rolling terrain dissected by a dendritic pattern of rivers and streams. The Coastal Plain is separated from the Piedmont by what is known as the Fall Line. This zone of great topographic change runs through Lexington County just below Lake Murray. The area from the Fall Line to the southern reaches of the county is mostly level terrain formed from sea level retreat.

Underlying most of the soils on the Piedmont Plateau is the Carolina Slate Belt which consists of shale and schists. The principal rock type of this geologic belt is an argillite which has a fine grain texture and concentrations of silica and alumina. These rocks provide the parent material for the Georgeville-Nason soil association which is characterized by gently to strongly sloping terrain, welldrained soils, and clayey subsoils that have a high silt content. Approximately 15 percent of the county has Georgeville-Nason soils (U.S. Department of Agriculture, 1976).

A narrow band of quartz-microline gneiss rock is located at the Fall Line separating the Southern Piedmont Province and the Atlantic Coastal Plain. This granite and gneiss rock, high in quartz and mica provide the parent material for the Cecil-Appling soil association. The Cecal Applying soils, which comprise approximately 9 percent of the county, have gently to strongly sloping terrain, welldrained soils, and clayey subsoil, low in silt content.

The Sand Hills, the upper portion of the Atlantic Coastal Plain, consist of four geologic formations of unconsolidated marine sediments. The largest and oldest is the Tuscaloosa formation which expands from the Fall Line southward to cover over half of Lexington's coastal plain. This formation consists of light-colored sands with patches of kaolin clay. Overlying most of this is the Lakeland-Blaney soil association which comprises approximately 53 percent of the county. The Lakeland-Blaney soil association has very well-drained and level to strongly sloping soils. Some areas of the Sand Hills are sandy throughout while other areas have a loamy subsoil and a fragipan (a subsurface horizon with little organic matter), are cemented, and relatively impermeable to water (U.S. Department of Agriculture, 1976).

The Barnwell Sand formation, located in the southeastern part of the county, consists of yellow and reddish sands that contain various concentrations of clay. The Lakeland-Fuquay soil association, approximately 10 percent of the county, lies over this nearly flat formation and has some excessively drained soils due to its porous nature.

In the southern portion of the county, the McBean geologic formation is a gently sloping plain consisting of medium-grained sand, sandy clay loams, thin layers of clay, and fullers earth. Soil associations that overlie this formation are part of the Lakeland-Blaney, Lakeland Fuquay, and Dothan-Troup-Fuquay associations. The Dothan-Troup-Fuquay association is very similar to the previous two described above and makes up 11 percent of the soils in the county.

The Sunderland formation, found in eastern central Lexington, adjacent to the Congaree River valley, is a sand and gravel marine terrace. Above this formation is the nearly flat Congaree-Toccoa-Brogdon association. Most of this area has soils which are well-drained, however, there are some soils in areas of local depression which are poorly drained and subject to flooding (U.S. Department of Agriculture, 1976). The various soils of Lexington County are best suited to uses which have adapted themselves to the characteristics of the soil. Fertile soils which support prime farmlands are the Georgeville-Nason, Cecil Appling, Dothan-Troupe-Fuquay, and the Congaree-Taccoa-Brogden soil associations. However, the Lakeland-Blaney soil association with some Fuquay soils holds some 65 percent of the agriculture in Lexington. These additional farmlands have well drained sandy soils which support 59.3 percent of the forest land also (Appendix B). All soils found in the county are low in plant nutrients and organic matter. However, fertilizer and lime can be added to obtain top crop production.

Erosion is also a problem for sloping soils when the land is cultivated (U.S. Department of Agriculture, 1976). Crop land, which constitutes 13 percent of Lexington's land area, is losing 341,479 tons of sediment per year. Sheet and/or rill erosion account for 41.5 percent of the total crop land erosion. Erosion reduces productivity of the soil with loss of the rich surface layer which is needed for root growth. It also allows sediment to enter the streams to pollute and endanger wildlife. Sloping fields which have undergone erosion have clayey spots which are difficult to till and plant because the surface soils are gone. Different management techniques can be used to minimize erosion. Cropping systems which keep vegetation on the soil for long periods of time help to hold the soil in place. Contour tillage and terracing reduces the length of the slope and runoff. Terracing works well with deep, well-drained soils which have regular slopes. Leaving crop residues on the soil surface will also hold loose sediments in place and increase infiltration, which in turn reduces runoff.

Soils used for non farming activities, such as engineering projects have characteristics which could limit their utility. Factors important to development capabilities include load bearing for foundations and streets and permeability for septic tank absorption fields (U.S. Department of Agriculture, 1976). Approximately 63 percent of all urban development (which is only 15 percent of the county) is done on Lakeland, Blaney, and Fuquay soils. This includes most of the West Columbia, Leesville, Batesburg, and Pelion areas. As more urbanization occurs in these areas, valuable agricultural land is being compromised.

## COUNTY MAP WITH CITIES

9

# CULTURAL RESOURCES ELEMENT

#### **Overview**

Though named after the 1785 battle of Lexington in Massachusetts, the recorded history of the county predates that year by almost 70 years. One of the first inhabited settlements was a small Congaree Indian village located at the junction of Congaree river and Congaree Creek south of Cayce. In 1718 a fort was built as a military garrison for the area, with a second post established two miles north in 1748. The two Congaree forts were significant as strategic cross roads for defending the Carolina back country. The county was given some political identity in 1733 as part of Congaree District, one of 11 districts containing townships laid out to provide defensive buffers for Charles Towne against hostile Indians.

In 1735, Congaree district was renamed Saxe Gotha in an attempt to lure German immigrants to the agricultural opportunities of the South. Because Saxe Gotha was located in a low, fever ridden area, the settlement shifted toward St. John's Church. The community, including Fort Congaree, became collectively known as St. John's. With the opening of the wagon road to Augusta in 1754, traffic on the river began to increase. However, the population of St. John's began returning to the original site, near the ferry, where Granby Village was established sometime before 1774. Unfortunately archeological evidence of the two sites is quite difficult to trace.

The area gained county status on March 12, 1785 in the Orangeburg District. Its western boundary extended west to the old Ninety-Six Precinct Line. Five years after the Louisiana purchase of 1803, Lexington County enlarged its own boundaries with gains from Newberry County along the lower Dutch Fork. The county continued to gain land with more acquisitions in 1832 (south to the North Edisto River). This parcel was previously part of the Orangeburg District. Saxe Gotha continued to be the name of the election district until discarded in 1852. From 1785 to 1832, Granby Village flourished and was named the county seat in 1785. By 1860, the county enjoyed some degree of industrialization although saw milling and cotton planting were the main occupations. As with many small southern counties, Lexington County endured many hardships in the aftermath of the War between the States. Appendix A identifies historic sites and structures in Lexington County.

#### City of Cayce

The present City of Cayce was not incorporated until 1914, but the area was populated from the early eighteenth century. Cayce was the location of Fort Congaree, a trading post established on the Old Cherokee Trail. This trail was later improved to serve as a wagon trail between the Piedmont and the Coast. The trading post was frequently referred to in contemporary reports as the "Town of the Congarees." In 1730, when the first eleven townships were established in South Carolina, the Cayce area was designated as the Saxe-Gotha Township, and because of its growing population, soon became an election district. A public ferry was established as river traffic increased, and this ferry helped the settlement groy to be one of the most important southern trading centers east of the Mississippi River, second only to Camden. In the following years, the name Granby came into use, presumably to honor the Marquis of Granby.

During the Revolution, Granby was taken and retaken by both sides. After the war, Granby became the seat of Lexington County. The area was also home to the Guignard Brick Works which manufactured bricks for almost every substantial building in the early history of Columbia. Granby's existence was short but important. As late as 1807 Granby was almost 200 houses larger than the new capital city of Columbia, but by 1837 the town was practically deserted. The development of Columbia and the problems with river floods were among the reasons for the town's decline. Today a cemetery and a historical marker are the only reminders of Granby. The present name of Cayce is in honor of an old family. William J. Cayce operated the first store near the railroad and this junction was known as "Cayce's Crossing." The city, originally chartered on September 7, 1914, covered an area of one and one-eighth square miles. In 1955 th Blossom Street Bridge connected Cayce with central Columbia. This contributed to dramatic growth in the city. Though Cayce was dependent on employment opportunities provided by the City of Columbia and served as its bedroom community, during the past two decades

the city has developed a more diversified economic base, with extensive retail commercial development, as well as industrial uses.

#### **City of West Columbia**

During the second half of the eighteenth century the Granby village flourished. Along with the naming of Columbia as the South Carolina state capital in 1786, Granby suffered severe flood damage in 1790; it disappeared by 1837. Granby's death was Brookland's birth because the materials from the demolished houses of Granby were used to build houses for the workers of the Saluda Manufacturing Company. The construction of this mill meant labor, people, and soon the town of Brookland. The scattered dwellings grew into a village on the river's west side after the opening of the Columbia Duck Mill in 1890. Meeting and State Street became business districts. The growth of this area was enhanced by its resources - its people, its transportation arteries, and prime commercial land. On November 24, 1894, it was named Brookland. Mrs. Mary Guignard, whose family remained the largest land holders in the area since the early 1800s, gave Brookland its name. It was later called New Brookland and was rechartered as West Columbia in 1938. In 1964, it was designated the City of West Columbia. Since 1964, the City of West Columbia has grown as a result of annexing large acreage of new urban development. City's boundaries now extend west of I-26. Over the years West Columbia has invested in water treatment, distribution, and has purchased an equity participation in the Columbia Metro wastewater treatment plant on the Congaree River. West Columbia has been awarded several grants to upgrade housing. Preservation of its historic Mill Village is a priority. West Columbia's history in the latter years of the 20th century has been oriented to improving its physical and historical environment through zoning, sign ordinances, housing code adoption, and capital investments.

#### Town of Irmo

Though incorporated in 1890, Irmo has a rich heritage dating back to the Colonial days of the 1740s. During those pre-Revolutionary War Days the first wave of immigrants from Germany and Switzerland began to settle in the area known as Dutch Fork. Bounded by the Saluda and Broad Rivers, Dutch Fork provided a haven for the immigrants in their quest for land which was unattainable in their native countries. As the Crown of England sought to maintain a presence in the prosperous agrarian culture of the area, a relationship was forged with land grants given the settlers by the Crown, a relationship which helped lay the foundation for the Town of Irmo.

During the five-year period between 1744 and 1749, 423 settlers purchased 21,150 acres of land, with a continual influx of Germans immigrants. By 1760, however, the German immigration slowed. Though the great number of immigrants slowed, the population carried the Dutch Fork area into the Golden Era of 1820 to 1861. When the emergence of the second generation of immigrants came about, larger farms began to develop, and a state of order existed with the church as the centerpiece. This era ended with the Civil War, which proved to be more devastating than both the Indian wars and Revolutionary War combined. Many families became destitute during the chaotic Reconstruction era. The perseverance of the Dutch Fork community provided the foundation for the prosperous area it is today.

Irmo was incorporated on December 24, 1890, one square mile in size. Many events have aided the town in staking a permanent place in the future of the Midlands. First, and arguably foremost, is the arrival of the CN&L Railroad in 1890, to which Irmo owes its existence. The railroad improved transportation, provided farmers and cotton brokers with better opportunities, and made Irmo the first water stop on the CN&L run. The second major development in the area was the construction of the Lake Murray Dam. From 1927 to 1930 more than 4000 people were employed on the project. This provided an economic boom to the area. The lake began filling in 1929, reached an elevation of 290 feet in 1930. The completion of the project allowed SCE&G to provide electricity to most of the region.

From 1930 to 1970, Irmo began the transition from a small community to the predominantly suburban city in existence today. This transition was accomplished through infrastructure improvements, principally those pertaining to transportation. Through the paving and widening of major Irmo-area roads such as Highway 76, Highway 60, Woodrow Street and present-day St. Andrews Road from the early 1940s to the late 1970s, to the construction of I-26 and I-20 in the late 1960s and early 1970s, the foundation was laid to support the impending growth that the town experienced. Along with these transportation improvements came educational and government improvements as well. New schools were built, culminating in the construction of the present Irmo High

School in 1965. There began an expansion of government services provided, leading to the creation of the Irmo Fire District in 1963, the Irmo-Chapin Recreation Commission around the same time, as well as twenty-four hour police service in the 1970s. These and other improvements led to Irmo's being able to accommodate the great growth experienced in the 1970s and 1980s, as evidenced by the construction of Friarsgate and other subdivisions which followed.

#### Town of Batesburg-Leesville

Prior to completion of the Columbia, Charlotte, and Augusta Railroad in 1869, Batesburg and Leesville were only small clusters of a few homes and shops serving a geographically restricted agricultural hinterland. Completion of the railroad expanded the commercial service area of each settlement (Batesburg looking north and west, and Leesville, south and east). Leesville was subsequently incorporated in 1875 and Batesburg in 1877. Prosperity in both towns and their evolution into enduring communities occurred largely during 1880-1914. After the end of the World War I, national recession coupled with the arrival of the boll weevil stifled an agriculturally dependent economy. The Depression and World War II also restrained local development until the late 1970s. In 1993 the towns merged and incorporated as one jurisdiction.

#### Town of Lexington

In the wake of the decline of Granby village, on December 18, 1818 the General Assembly passed an act to change the county seat to a location near the geographic center of the county on a hill near Twelve Mile Creek. The new village of Lexington and the district grew. Many of its citizens joined the westward migration following the expansion of the southern cotton kingdom in the first half of the 19th century.

Because of population growth and the need to create a municipal corporation around the new county courthouse, the citizens of Lexington received a charter in 1861. The town continued its slow growth through reconstruction and expanded to assume its historical urban morphology during the prosperous decades from 1893 to 1920 and the coming of the boll weevil. The town and its environs benefitted from the Depression as the rural population moved to urban areas. After World War II the town grew slowly as the county population trends reversed and the county gained population. In 1970 the town recorded a population of 969 persons. Road improvements and the general rapid growth of the county were reflected as new subdivisions located in the town. Developers took advantage of the town's ability to provide water and sewer. Building I-20 south of the town during 1966-72 also helped promote rapid growth that continues to this day.

#### Town of Chapin

The first settlers in the area numbered close to 200 families from the Palatinate in southern Germany. Many left Europe seeking religious freedom. These German settlers maintained their own subculture and spoke German well into the 20th century. Martin Chapin of Cortland, New York moved to the area in 1856 on the recommendations that the pine trees would help his lung ailment. By the 1890s, he had amassed more than 4200 acres in the Chapin area. Over half of the property titles researched for the building of Lake Murray could be traced back to Martin Chapin. He built a large wooden home facing Old Chapin Springs from the proceeds of his saw mill business. The home stood at the present day Foodland Grocery store site. The Columbia, Newberry, and Lauren Railway brought the first railway stop to Chapin in 1890. Martin Chapin used this railway to ship his timber to other parts of the state. The town began to grow with the introduction of this rail service. Chapin was officially incorporated on Christmas Eve, 1889 with the town limits extending 3/4 of a mile in all directions from Martin Chapin's home.

The main events in the 20th century history of Chapin relate to utilities and transportation. The acquisition of property for the Lake Murray dam during the 1920s brought employment and capital to the area. The Great Depression postponed prosperity and population growth until after World War II. In 1961, I-26 was opened and gave the town national connectivity. Developers capitalized on the proximity to Lake Murray. Today Chapin and its surrounding census tract have the highest per capita income in Lexington County.

#### Town of Springdale

Incorporated in 1955 Springdale provides municipaservices to a settlement that emerged west of both Cayce and West Columbia. After the passage of Home Rule legislation in 1975, Springdale filed on September 14, 1976, with the Secretary of State to retain its council form of government. The rechartering according to the terms of the Home Rule Act became effective in Springdale on July 1, 1977. The town area at the time was 1.67 square miles. Today the predominantly residential town is expanding its commercial and industrial development.

#### Town of Swansea

The Town of Swansea was begun as a station for the South Bound Railway (today's CSX Transportation). The town was surveyed and laid out around 1890 when the tracks were first laid. The original charter for the town was approved on December 19, 1892. Its boundaries were established as a half mile radius from the rail depot. The town was rechartered on February 8, 1904. The origins of the name "Swansea" are vague. Quite possibly it came from "Zwanzig", which is German for the number 20. Due to the large number of German settlers in the area, and the geographic fact that the town is located approximately 20 miles from Columbia, Lexington, Orangeburg and St. Matthews, the term "Zwanzig" may have been used to describe the general location of the area long before the railroad was established. However, the name may have come from the town of Swansea in Wales.

The urban morphology of Swansea was largely determined in the last century when the town grid system was set forth by railroad engineers. In the years since its founding, the town has grown only slowly. The town was awarded a Community Block Development Grant in 1979 to reverse decades of commercial decline and today the town is improving its economic fortunes by close cooperation with the County.

#### **Towns of South Congaree and Pine Ridge**

The construction of the Southern Railway between Columbia and points south stimulated the economy as did the location of a freight and passenger station at Styx prior to World War I. Camp Styx was developed in the Pine Ridge/Congaree area during World War I as a troop training facility. During the war, Highway 302 was paved through the Styx Area and the U.S. Military reservation was developed which further stimulated the economy. In the late 1970s as Cayce began to annex territory westward, itizens of the Congaree area became concerned that they would be annexed into Cayce. So in 1957 the landowners within one mile radius of the J. J. Chavis Grocery store on the south side of Highway 302 drew up a legal incorporation petition and held a successful election to establish the Town of South Congaree. A year later, in the summer of 1958, the land owners within one mile radius of the intersection of Highways 103 and 73 drew up a legal incorporation petition to establish the Town of Pine Ridge.

Gradually, since the incorporation of the two towns, the area has grown in population and physical subdivisions have taken advantage of the nearness to cities of Columbia and Cayce. Employment opportunities afforded by industries in Calhoun County and in Columbia Metro area have also led people to live and work there. The two towns have benefitted from the location of new schools by Lexington District 2 and by the decision of Cayce to extend water and sewer to the area. This has promoted additional residential and commercial development in the area; note the completion of the new UPS terminal on Highway 302 near South Congaree.

#### **Town of Gilbert**

The Revolutionary War "Battle of the Juniper" occurred at a spring just east of the present town site. In 1782 the spring was the only named place between Granby and Leesville. Juniper Springs was a landmark where the Old Charleston Road from Ninety-Six crossed Two Notch Road between Augusta and Columbia. Sometime after the Revolution a Gilbert family settled nearby and the place became known as Gilbert Hollow. A railroad station was established at Gilbert Hollow in 1869. After the Lewies built their mansion they attempted to change the name to Lewiedale. They persuaded the post office, newspaper, high school, Masonic Lodge, and the liquor dispensary to use the new name. The town was incorporated as Lewiedale in 1886 but the name was changed to Gilbert on May 12, 1899.

#### **Town of Pelion**

During the late 19th century Lexington County's dominant rural, agricultural character was altered slightly by the emergence of some dozen small towns and crossroad villages spurred by the expansion of rail lines and the establishment of locally capitalized textile mills. One of those emerging towns was Pelion, chartered as a municipality in 1912.

#### Town of Summit

Dr. F. S. Lewie laid out the streets of Summit Point, the original name, on June 3, 1873. Its location along the Columbia, Charlotte and Augusta Railroad was its primary reason to exist. Summit's first charter was issued in May 1892. It was renewed in May 1901. At first the incorporated limit of Summit was a square mile. During 1928, the corners were cut off the square and the boundary was made into an octagon. In 1928, Brodie Light and Power came into Summit. In 1940, Brodie Light and Power Company sold out to S.C. Electric and Gas Company. During the same year Gilbert and Summit began to develop a water system together.

#### **Historic Districts**

The US Department of Interior accepts nominations to the National Register of Historic Places for individual sites and for districts. The National Register denotes a district as an area that possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. In Lexington County, there are five listed districts on the National Register.

#### Saluda Factory Historic District

This district along the Saluda River is located in the City of West Columbia. It is identified with three contributing properties that exhibit the scenic site and ruins from the factory, abutments of a razed bridge, and traces of old State Road.

This district reflects the town's early history of textile manufacturing, South Carolina's largest industry. This was the site of Camp Sorghum, important as one of a handful of Confederate prison camps. Riverbanks Botanical Garden makes its home here now.

#### New Brookland Historic District

This district, located in the City of West Columbia, is bounded by portions of Alexander Street, Augusta Street, Carpenter Street, Center Street, Court Avenue, Hudson Street, Norfolk Street, Oliver Street, Sortwell Street, State Street, and U.S. Highway 1. Identified with fourteen contributing properties that date back to 1894, this district exhibits late nineteenth and early twentieth century residential and commercia structures. The architectural styles include Romanesque, Georgian Revival, Gothic Revival, distinguished L-Shape frame dwellings, and vernacular frame dwellings.

This district reflects the commercial influence of the mill on the community, with ample gardens and 50-foot wide streets.

#### **Batesburg Commercial Historic District**

This district in the Town of Batesburg-Leesville is bounded by parts of Granite Street, Oak Street, Rutland Avenue and Pine Street between Church Street and North Railroad Avenue.

The district is a collection of commercial buildings constructed between 1895 and 1925 encompassing thirtyone properties within a three-block area. Some of the visual elements in the district which articulate the period setting are original cast-iron pilasters or columns, decorative brick trim, and concrete block molded to imitate stone.

The commercial district is significant because it development patterns reflect an early twentieth century railroad town. It evolved as a banking and trade center for parts of several counties including Lexington, Aiken, and Saluda.

#### **Church Street Historic District**

This district is bounded by a portion of Church Street between Auerhammer Drive and Gunter Road in the Town of Batesburg-Leesville. Identified with six buildings constructed between 1865 and 1909, the district retains integrity from the period with Victorian, Queen Anne, Gothic Revival, and Italianate styled structures preserved in good to excellent condition. The historic district is significant as a neighborhood that developed in accordance with the birth and initial economic development of the town of Leesville during the late nineteenth and early twentieth centuries.

#### Leesville College Historic District

This district is bounded by portions of College Street, King Street, Lee Street, Main Street, and Peachtree Street, located in the town of Leesville, S.C. Identified



with 28 contributing properties which span a time period from ca. 1880 to ca. 1930, this district exhibits a wide range of Victorian vernacular forms, from modest cottage to elaborate residence, but scale is consistent. Some elements include elaborate scroll and bracket ornamentation, fluted wooden columns, and turned balusters. This district reflects its evolution as a residential enclave around the Busbee Brothers' School and the Leesville English & Classical Institute, the latter of which became Leesville College in 1890.

#### Unique or Significant Natural Areas and Views

Since the mid-1970s, the SC Department of Natural Resources' Heritage Trust program has conducted limited reconnaissance surveys throughout the State identifying areas meriting preservation or protection. Most of these sites contain either rare or endangered species of plants or animals and often are unique in nature given its geologic or topographic character. While the county has not undergone any exhaustive survey work, a listing of the more prominent sites is provided in Appendix B.

#### **Riverbanks Botanical Garden**

The 70-acre Botanical Garden site is located on the west bank of the Saluda River across from Riverbanks Zoo. In addition to being a site of unmatched beauty in the area, it has significant historical value as the location of one of South Carolina's first water-powered textile mills and as the site of Sherman's march on Columbia.

The Botanical Garden site features three distinct topographic land masses: the flood plain valley, the valley slopes and the uplands. Each area is unique and provides countless opportunities for botanical displays and educational programming.

# COMMUNITY FACILITIES ELEMENT

#### **Major Public Water Systems**

Major public providers in Lexington County include: City of Columbia, City of West Columbia, Lexington County Joint Municipal Water & Sewer Commission, City of Cayce, Town of Lexington, Town of Batesburg-Leesville, Town of Chapin, Town of Pelion, Town of Swansea, Gilbert-Summit Water District, Gaston Water District and the Bull Swamp Water District. There are several private systems.

#### Service Areas and Treatment Capacity

The City of Columbia provides water service to portions of Lexington County north of the Saluda River in the Dutch Fork area. The City of Columbia's water supply comes from two sources: the Broad River (Columbia Canal) and Lake Murray. The two water treatment plants and more than 1,640 miles of distribution mains serve all of the City of Columbia and portions of Richland and Lexington County. The customer population served is approximately 90,000. The Columbia Canal Plant has a rated treatment capacity of 72 MGD (Millions of Gallons per Day), with average and maximum recorded high service pumping rates of 31 MGD and 70 MGD respectively. The Lake Murray Plant has a rated treatment capacity of <u>30 MGD</u>. It has an average high service pumping rate of 18.8 MGD with a maximum recorded high service pumping rate of 28.4 MGD.

The **City of West Columbia** gets its water supply from its two treatment plants on the Congaree River and Lake Murray. The customer population served is approximately 15,701. The total average pumpage is 4.9 MGD. The total plant capacity is 12 MGD. The total storage capacity including elevated and ground tanks is 11.5 million gallons. The per capita use is about 126 GPD. The city sells at least 0.5 MGD to smaller systems. The Lexington County Joint Municipal Water & Sewer Commission purchases its water from the City of West Columbia's Lake Murray Plant. Its allocation is approximately <u>2 MGD</u> with consumption currently operating at about 1 MGD. The system has about 2,300 customers. The system operates with an elevated 500,000 gallon storage tank.

The City of Cayce gets its water supply from the Congaree Creek and its water treatment plant is located on US 321 near Dunbar Road. The approximate population of customers served is 6,023. The average pumpage is 3.2 MGD. The total plant capacity is 6.4 M.D. with the total storage capacity of 5.72 million gallons, including elevated, ground and pressure tanks. The per capita use is 140 GPD. Major distribution lines run throughout the City of Cayce as well as portions of the Town of Springdale and several areas of unincorporated Lexington County. The unincorporated areas include the Three Fountains area, areas out SC 302 toward South Congaree and Pine Ridge, areas out Fish Hatchery Road, the Lloydwood subdivision south of the City, and a new industrial park off Dixiana Road, in the southern part of the city, near the I-26/I-77 interchange.

The **Town of Lexington** gets its raw water supply from the Twelve Mile Creek and its water treatment plant is located in town where the Creek crosses Highway 6. The average pumpage is 1.5 MGD and the customer population served is approximately 3,452. The total plant capacity is 2.8 MGD and the total storage capacity including elevated, ground and pressure tanks is approximately 1.32 million gallons. The per capita use is 237 GPD.

The **Town of Batesburg-Leesville** gets its supply of raw water from Lightwood Knot and Duncan Creeks. The average pumpage of the plant is 1.1 MGD. The approximate population served is 2,561. The total plant capacity is 2.1 MGD. The total storage capacity including elevated, ground and pressure tanks is 1.45 million gallons. About 125,000 GPD is sold to the Town of Ridge Spring, in Saluda County.

The **Town of Chapin** now obtains most of its water from the City of Columbia (since 1990 when City of Columbia completed a water line extension to the Chapin water tank). The old tank had a capacity of 150,000 gallons and the new tank holds 2.0 million gallons. Water acquired from wells goes to Timberlake, Oakbrook, Plantation Hills, Night Harbor and Tanners Mill subdivisions. It is anticipated that these will be deeded to the City of Columbia when water line extensions are completed to these areas.

The **Town of Pelion** purchases 75,000 to 80,000 gallons per day from the Lexington County Joint Municipal Water & Sewer Commission. The Town also serves areas outside its jurisdiction.

The **Town of Swansea** has three wells that provide service to its residents. These wells provide a water supply of approximately <u>162,000</u> gallons per day.

The Gilbert-Summit Rural Water District was established by the General Assembly in 1970s for service to the towns of Gilbert and Summit. The system now serves some areas immediately adjacent to both towns. Its water supply is from eight groundwater wells, with storage capacity of 540,000 gallons from three tanks. The customer population is approximately 1070 persons. The system averages 30,000 gallons per day pumpage.

The **Gaston Rural Community Water District** was established by the General Assembly in 1966. The Water District has five groundwater wells as its water supply and maintains three storage facilities with a combined capacity of 300,000 gallons. Its service area is the Town of Gaston and the immediate surrounding area. The customer population is 1400 persons.

Other Non-public Providers: AAA Utilities Inc. provide water to some subdivisions and mobile home parks in the vicinity of Lake Murray. Carolina Water Service also provides water to some residential subdivisions in Lexington County. Heater Utilities, Inc. provides water service to quite a few areas in Lexington County. Some of these are Bellemeade near Cayce, Charwood, Lexington Estates, Lexington Farms, Murray Park, Murray Lodge, Lake Village, Hilton Place, Vanarsdale and Windy Hill.

#### Wastewater

The City of Columbia, Lexington County Joint Municipal Water & Sewer Commission, City of Cayce, City of West Columbia, Town of Lexington, Town of Chapin, and the Town of Swansea are the public sewer providers in Lexington County. Several private smaller providers cover part of the county. Many homes use septic tanks.

#### Service Area and Treatment Capacity

The **City of Columbia's** main treatment plant is located on the Congaree River and has a treatment capacity of 40 MGD. With more than 850 miles of sewer lines, the City currently provides sewage treatment services for all of Columbia and portions of northwest, north central, northeast, and lower Richland County, and portions of northeast Lexington County. The customer base is approximately 45,000 to 50,000 accounts. Average daily flow is 30 MGD.

The Lexington County Joint Municipal Water & Sewer Commission operates two wastewater treatment plants. The Two Notch Road Plant serves part of the I-20 and US 1 Industrial Corridor and has an existing capacity of 400,000 gallons per day. The County currently uses an average of 250,000 gallons per day. The Old Barnwell Treatment Facility, located off Platt Springs Road, serves the growing Platt Springs Road and Red Bank areas with an existing capacity of 800,000 gallons per day.

The **City of Cayce** has a sewage treatment plant off Old State Road near the Congaree River which has a capacity to treat eight million gallons per day. Most of the incorporated areas of Cayce presently have available sewer service. The City also provides sewer service to other areas of Lexington County including portions of West Columbia, all sewer service to Springdale, the Three Fountains Area, SC 302 toward South Congaree, Pine Ridge, Fish Hatchery Road, and off Dixiana Road south of the City.

The **City of West Columbia** serves residents within its jurisdiction. The City does not have its own wastewater treatment plant. It sends its wastewater to the City of Columbia for treatment.

The **Town of Lexington's** current sewer treatment capacity is 2.0 MGD with a current average daily flow of 1.3 MGD per day. Its two treatment plants are located on Twelve Mile Creek below Coventry Woods Subdivision and on Fourteen Mile Creek at Whiteford Subdivision. The town anticipates that both plants will be off-line by the turn of the century with all effluent pumped to Cayce's plant.

The **Town of Chapin** has a wastewater treatment plant with a capacity of 1.2 MGD. The Town treats 200,000 gallons per day of its own sewage and 600,000 gallons per day for outlying communities and subdivisions.

The **Town of Swansea** has an oxidation pond that has a capacity of 160,000 gallons per day. The town's

average flow is 110,000 gallons per day. Rains cause the lagoon to overflow and it has to be monitored carefully.

Other Non-Public Providers: Bush River Utilities services some areas along Bush River Road. Lakewood Utilities provide service to the vicinity of Rikard Nursing Home. Midlands Utilities services Westgate and Vanarsdale subdivisions between Lexington and West Columbia and several other subdivisions in the unincorporated area of Lexington County. Quail Hollow subdivision operates its own sewer system. Carolina Water Service serves the area around the I-20/ Highway 1 area and several residential subdivisions in the County. Woodland Utilities, Inc. serves Woodland Hills and Seven Oaks Elementary Schools.

#### Transportation

#### **Highway Network**

Lexington County has the second highest number of road miles in the four county Central Midlands region. The state Department of Transportation (DOT) maintains more than 1,225 miles of secondary streets and roads, all paved except for 51 miles of unpaved roads. The transportation planning for most of Lexington County is coordinated with Central Midlands Council of Governments. The Columbia Area Transportation Study (COATS) is approved by the Central Midlands Council of Governments board. COATS is coordinated with the state DOT. The current plan covers 1998-2003. A copy of this plan is available through Central Midlands Council of Governments. Current plans include intersection improvements, airport area improvements, widening US Highway 378, Highway 6 Bypass and Dam project, and others throughout the county.

Lexington County's Department of Public Works maintains about 766 miles of unpaved roads and 269 miles of paved roads. Around 8 miles of county roads are paved yearly, with priorities based on such factors as traffic count, maintenance costs and the number of households accessing the roads. The Department has 69 employees working out of headquarters on Ball Park Road near Lexington and three other district offices: on Murray Lindler Road near Chapin, on South Lee Street near Batesburg-Leesville, and on Martin-Neese Road near Swansea.

It is clear that Lexington County's development pattern changed from its initial development adjacent to

the Congaree River to include a more northwesterly trend – toward the Town of Lexington and Lake Murray. Traffic volume in this area confirms this flow and suggest, continued improvement of capacity along highways that feed the area around the Town of Lexington and Lake Murray.

	HIGHWAY MILES BY FUNCTION	
	MILES	PERCENT
INTERSTATE	57	10 %
MAJOR ARTERIAL	71	12 %
MINOR ARTERIAL	140	24 %
MAJOR COLLECTOR	320	54 %
TOTAL	588	100 %

Traffic flows along interstate highways traversing through Lexington County (I-20, I-77 and I-26) indicate no deficiencies in capacity. There are two interstate interchanges within the county: I-20 & I-26 and I-26 & I-77. Of the major arterials, only one location has been identified as nearing capacity, with all others operating under satisfactory conditions. This roadway section is located on US 1 (Augusta Road) between S-71 (Wattling Road) and SC 12 (Jarvis Klapman Boulevard). Four minor arterial roadway segments have been identified as operating within a capacity deficiency:

- 1) US 1 (E/W Main Street) from US 378 (Columbia Avenue) to SC 6 (N/S Lake Drive)
- 2) SC 602 (Platt Springs Road) from S-365 (Wilton Road) to S-404 (Crapps Avenue)
- 3) S-71 (Wattling Road) from US 1 (Augusta Road) to S-104 (Old Barnwell Road)
- S-757 (Harbison Boulevard) from I-26 to Country Squire Road

Although the remaining minor arterials operate under good conditions, S-36 (St. Andrews Road) between J 26 and S-173 (Sidney Road) is nearing capacit Evaluation of major collectors in the county indicates that the following locations are nearing or over capacity:

SC 6 (N Lake Drive) from S-68 (Corley Mill Road) to US 378 (Sunset Boulevard)

## COATS-SIB MAP

[THIS MAP IS MAINTAINED AT THE CENTRAL MIDLANDS COUNCIL OF GOVERNMENTS. A SMALLER VERSION IS BEING PREPARED TO FIT HERE.]

- SC 6 (S Lake Drive) from US 1 (E Main Street) to SC
  - 302 (Edmund Highway)
- S-48 (Columbia Avenue) from S-49 (Clark Street) to I-26
- S-70 (Two Notch Road) from S-168 (Emanuel Church Road) to S-686 (Shirway Road)
- S-168 (Emanuel Church Road) from S-72 (West Dunbar Road) to S-70 (Two Notch Road)
- S-370 (Ninth Street) from US 1 (Meeting Street) to S-280 (D Avenue)

#### **Transit** Network

South Carolina Electric & Gas is the only public fixed route transit provider in Lexington County. The utility's unique involvement in the provision of public transportation is the result of commitments made by the company in the late 1920s and upheld by the courts in the 1970s. This commitment to provide public mass transportation was made in exchange for SCE&G's use of public rights-ofway for electric and gas transmission.

The system has a total of 34 fixed routes that operate daily with an estimated 9,100 passengers per day. Service runs both weekday and weekend, with some routes operating till midnight. Of the 34 fixed routes, 4 routes extend into Lexington County, covering the City of West Columbia, City of Cayce, St. Andrews area and the Metropolitan Airport.

Another transit network operating in the urban area is DART (Dial a Ride Transit). DART is a public transit system providing transportation for disabled people. DART is funded by SCE&G since most of SCE&G's regular buses are not handicapped-accessible.

#### **Rail** Network

Lexington County's rail lines radiate out from the City of Columbia. There are four major routes:

- 1) From Columbia through Irmo and Chapin to the northwest, operated by CSX Transportation,
- From Columbia through Cayce, Lexington, Gilbert, Summit, and Batesburg-Leesville and on to the west, operated by Norfolk Southern,
- From Columbia through Cayce and South Congaree to the Edmund community, operated by Norfolk Southern. The rest of this line, to Pelion and on southwest was abandoned in the 1990s,

4) From Columbia through Cayce, Gaston, and Swansea and on southward, operated by CSX Transportation. This line also hosts Amtrak passenger trains.

There are no places for passengers to board in Lexington County. The closest Amtrak station is in downtown Columbia.

#### Airports

Air traffic coming into the county has the option of landing at two public airports and several private runways. The two public airports are Columbia Metropolitan Airport, near Cayce and Springdale, and Pelion Corporate Airport. Columbia Metropolitan is a large, full service airport with two long runways (8,600 and 7,001 feet) and a newly rebuilt terminal. It provides scheduled airline service for the region, serves general aviation needs, commercial cargo service and numerous freight operators. Columbia Metro recently added a UPS hub to its list of commericial clients. Two fixed-base operators also serve the Metro facility with various charter flights. The airport maintains a newly dedicated air cargo terminal, expanded and renovated passenger terminal, the Columbia Airport. Enterprise Park (CAE Park) and Foreign Trade Zone #127.

Pelion Corporate Airport located near the Town of Pelion serves as a general aviation airport with one long runway (4,350 feet). Several private air fields are also scattered throughout the county. During the 1990's, two residential subdivisions have been built around private air fields.

#### Other transportation modes

Walking trails and bike routes are slowly being developed throughout the county. The majority of these trails are near subdivisions, parks, and along major highways.

#### Solid Waste

Lexington County's Solid Waste Department consists of 12 convenience stations and approximately 65 personnel to serve the unincorporated areas of the county and four towns. Residential collections are in place for eight municipalities in the county. The recycling effort has been centered in the convenience stations, although West Columbia, Town of Lexington, and Cayce have initiated pilot curbside recycling programs.

#### Collection

**Residential**: There are five private haulers franchised by the County to pickup and haul residential wastes from the unincorporated areas: David Ard's for Pine Ridge, South Congaree, and Gaston; Dreher Sanitation for Lake Murray; Hagan Sanitation for Whitehall; and Johnson Sanitation for Irmo and Columbia; and Columbia Container Corporation for Mineral Springs/St. Andrews area. The major towns in the county operate their own residential collection systems.

The Cities of West Columbia and Cayce use garbage bags provided by the City which are picked up once a week at curb side in West Columbia and four days a week in Cayce. There is no charge to the residents for this service which is property tax financed.

Springdale operates its own collection system. The Town uses roll carts for residential and picks up twice a week for garbage and once for trash at the curb side. There is a basic charge to the resident.

Lexington contracts residential solid waste collection to Carolina Container Corporation (CCC). The Town uses garbage bags with curb side pick up once a week. This service is property tax financed with no service charge to the residents.

Batesburg-Leesville contracts with CCC for residential collection. The collection is done once a week on the curb side. CCC provides the residents with roll carts. There is a charge for this service which appears on the residents' water bills. The yard trash is collected by the town and taken to their own landfill.

The Town of Chapin operates its own collection system. The residential pick up is once a week on the curb side. The residents are provided with garbage bags. There is no charge to the residents for this service.

Irmo contracts with BFI for residential collection for which the residents are charged \$9.50 per month.

The Town of Gaston contracts with David Ard's Sanitation and the pick up is twice a week from roll carts on the curbside. There is a monthly fee of \$10.00 that the collector charges.

**Commercial:** Commercial solid waste is collected by private haulers, except in a few municipalities where some commercial collection is a part of the municipality's pickup. The cities of West Columbia and Cayce collect solid waste from dumpsters. This service is free but there is a charge for extra collection. The collection is done once a week.

The Town of Springdale also collects commercial solid waste from dumpsters but there is a charge for the service. The collection is done once a week.

The Town of Lexington contracts with CCC for once weekly collection. There is a charge of \$25.00 for an extra pickup.

The Town of Batesburg-Leesville contracts with CCC for commercial collection. The collection is done once a week from dumpsters. There is an extra charge for more than one pick up.

Businesses in the Towns of Chapin, Gaston and Irmo are responsible for their own pick up. They contract with private haulers individually.

**Industrial**: Solid wastes are hauled either by private haulers or in some cases hauled by the industry itself, e.g., Allied Fiber, Pirelli Cable and Michelin.

#### Disposal

Lexington County owns and operates a 478 acre landfill. The site is located near Edmund close to the geographic center of the county. In addition there are four industrial landfills permitted within Lexington County: Allied Fibers, Owens Industrial, SC Electric and Gas, and Southeastern Concrete Products.

The County started using convenience stations in 1990 and 1991. All Lexington County citizens, municipalities and franchised residential collectors bring normal household trash to the county landfill at no charge. Other commercial haulers and private businesses are charged \$20.00 a ton for construction material and debris, and \$30.00 per ton for municipal solid waste. There is a transfer station on the Edmund Landfill site that compacts the municipal solid waste which is then taken to the Chambers Corporation landfill on Screaming Eagle Road in Richland County.

The Town of Batesburg-Leesville operates a landfill for inert materials. The Town contracts with a private collection agency for disposal of municipal solid waste.

#### Public Safety

#### Fire Protection and Emergency Management Systems

Lexington County: The County provides Fire and EMS service to the entire county except portions of Irmo, Batesburg-Leesville, West Columbia, and Cayce. The County does provide EMS services for Batesburg-Leesville and Cayce. The offices of the Fire and EMS Departments are in the basement of the Lexington County Administration building. The entire department has 125 employees with approximately 63 working for EMS and 65 for Fire. In some instances the Fire and EMS stations are located together. There are two stand-alone EMS stations, one in Batesburg-Leesville and the other near Swansea. Pelion and Batesburg-Leesville also have their own rescue squads.

**Chapin**: The main station is located on Lexington Avenue between Columbia and Chapin Roads and is a part of the Lexington County Fire Service. EMS operates out of this station 24 hours, seven days a week. Most of the time two paramedics are on duty. Chapin also has two other stations. One is located 100 yards beyond Long Pine Drive on Amicks Ferry Road. This station was established in 1994 and is known as the Amicks Ferry Station. The other is located at the intersection of Old Lexington Highway and Wessinger Road and is known as the Crossroads Station. All three stations are open twenty-four hours, seven days a week.

**Batesburg-Leesville**: The Town operates two volunteer fire stations. One is located on West Columbia Avenue, near Bethlehem Road on the Batesburg side of town. The other is located on East Church Street between Bernard and Main near the Main Street district on the Leesville side. EMS services are provided by Lexington County.

West Columbia: The City operates one fire station, with first respondent EMS services. The station is located at 610 N. Twelfth Street, and operates 24 hours a day with 23 employees. There is a possibility for future expansion. The City serves areas such as Springdale and out Highway. 1 to Ermine and out Highway. 378 to I-26 under contract with the Lexington County Fire Service. **Cayce:** The fire and the police departments in the City form the division of Public Safety. The division was moved to a separate building within the municipal complex in 1984. At the present time, the Public Safety Division has 47 full time employees including 35 sworn officers. The service area for the fire department extends approximately 4 miles out of Cayce City limits. The division has a total of six fire trucks in the station. The division also employees 33 are cross trained. Six citizen volunteers also work for the department. EMS services are provided by the County.

**Irmo Fire District**: Since 1963, fire protection in the Town of Irmo has been provided by the Irmo Fire District. The district boundaries include the part of town in Lexington County, and the town contracts with the Fire District to serve the portion of Irmo in Richland County. The boundaries also stretch toward the Saluda River and I-20 to the southeast, and Coldstream Drive to the northwest. The District serves approximately 65,000 citizens, including all citizens within the town limits of Irmo. There is one station located at the corner of Harbiso Boulevard and St. Andrews Roads.

#### Law Enforcement and Detention Facilities

The **Lexington County** Sheriff's Office headquarters and the County Jail are located at 521 Gibson Street in Lexington. There are several small substations scattered across the county where patrol and resident deputies do paper work. There are 266 employees; 164 are sworn officers, with 134 patrol personnel and detectives. There are 19 deputy districts. An addition was recently constructed to the jail and further expansion is currently under consideration. The current prisoner capacity is 272 with the average number of inmates at 320.

The **City of Cayce** Public Safety Division is located within the municipal office complex in a building separate from other City departments. Currently the department has 47 full time and 35 sworn officers.

The **Town of Irmo** Police Department is located at 1239 Columbia Avenue. The town has 16 sworn officers and two administrative personnel.

## MAP OF FIRE/EMS STATIONS

[THIS MAP IS AVAILABLE AT THE DEPARTMENT OF PLANNING AND DEVELOPMENT ON THE 5TH FLOOR OF THE LEXINGTON COUNTY ADMINISTRATION BUILDING. IT WILL BE REDUCED IN SIZE TO FIT THIS PAGE AT A FUTURE DATE.] The **City of West Columbia** Police Department has. 44 full-time employees and 5 part-time reserve officers. Out of the 44 full-time employees, 35 are police officers, and nine are administrative personnel. There are six officers and one dispatcher on duty at any given time. The City also has two part-time substations. One is located in the leasing offices of Gentle Pines Apartments at North Brown Street and the other in Westbridge Apartments at 100 B Avenue. There are no major expansion plans for the near future.

The **Town of Springdale** Police Department has recently moved into a separate building behind the Town Hall. The new office has adequate office space, lockers, and a shower room. The staff includes the Chief, a Captain, a Sergeant, four deputies, and two reserves. There is an anticipated increase of reserves in the near future.

The **Town of Lexington** Police Department has 22 officers, including four detectives. The department headquarters is in City Hall. There is also an office at the federally subsidized Park North apartments on Old Chapin Road. This office is utilized for paper work.

The **Town of Chapin** Police Department has a full time Chief along with a Captain and three officers that work part-time. Typically, four nights a week are covered by Town of Chapin officers and the other three nights are covered by resident deputies of the Sheriff's office.

The **Town of Batesburg-Leesville** Police Department has a total of 19 uniformed officers and five dispatcher/jailers. There are no satellite offices and no immediate plans to establish any. The town is divided into four districts, with teams of four working two, twelve hour shifts. The town would like to hire more officers.

The **City of Columbia** Police Department provides law enforcement of the portion of Lexington County it annexed in the Harbison Boulevard area. There is a police substation at 131 Lake Murray Boulevard.

#### Recreation

#### Parks

The Lexington County Recreation & Aging Commission Administrative Office is located at 563 South Lake Drive in the Town of Lexington, 1/2 mile from the County Administration building. The Recreation & Aging Commission maintains 26 lighted and two unlighted athletic fields, 39 lighted and five unlighted baseball fields, nine lighted and five unlighted soccer/football fields, 42tennis courts, seven multipurpose courts, six racquetball courts, three sand volleyball courts, playgrounds, six gymnasiums (another six are utilized through the school districts), six senior centers, three leisure centers, three community buildings, and a dance studio.

Lexington County also has a special purpose recreation district, the Irmo/Chapin Recreation Commission. The office is located at 200 Leisure Lane near Irmo. Saluda Shoals Park is a 250 acre park on the Saluda River, off Bush River Road. It includes Hope Ferry Landing, a nature center, picnic areas, and walking trails. This commission maintains parks in Chapin.

The **City of Cayce** is becoming an important recreational destination in the metropolitan area. The Cayce Riverwalk Development near the river front will be a major drawing card for visitors, as well as a catalyst for riverfront residential development. Guignard Park recently concluded several improvements.

The Richland County Recreation Commission oversees the parks and recreation within the Town of Irmo.

The Lexington County Recreation Commission maintains most of the parks in the City of West Columbia. The City does maintains the Carraway Park on Hudson Street. This park features a playground, picnic shelters, and benches.

There are two parks within the **Town of Springdale**, the Felton C. Benton Park next to the Town Hall and the Springdale Town Park. Both feature playgrounds and picnic shelters and are maintained by the Lexington County Recreation Commission.

In the **Town of Chapin**, the parks and other recreational facilities are maintained by the Irmo-Chapin Recreation Commission. See the list under Irmo-Chapin Recreation Commission.

The **Town of Lexington** has two parks with 10 acres of developed land. The Corley Street Park is a 3.5 acre facility with playground, spray pool, and picnic shelter. The Virginia Hylton Park, behind Town Hall, has seven acres developed with walking trails, a special needs park, stage area, goldfish pond, and an extensive garden system. Other land may be developed in the future.

In addition to all the government facilities, Sov Carolina Electric & Gas has picnic areas and boat landing on both sides of the Lake Murray Dam. These facilities are available to the public for a nominal fee.

### MAP OF PARK LOCATIONS

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#### Education

#### Schools

There are five school districts in the county: Lexington County School District One, Lexington County School District Two, Lexington County School District Three, Lexington County School District Four, and School District Five of Lexington and Richland Counties. Enrollment listed is for 1998-1999. Lexington County school students and schools consistently rank at the highest levels in the state for test scores, scholarship offers, percentage going to college, as well as other national recognitions.

**District One** enrollment is 15,906 students. In addition to the schools listed in Table 21, the district is building South Lexington High School on a 100 acre site on Platt Springs Road. Other major expansion plans include Lake Murray Elementary School and a new Pelion High School. District One is the largest district in Lexington County both by geographical size and by number of pupils.

**District Two** enrollment is approximately 9,400 students. There are two high schools, 4 middle schools, 9 elementary schools, and a continuing education center that includes an alternative school. There are no immediate plans for additions/renovations of instructional facilities. The fact that the population is shrinking in some areas while increasing in others presents a challenge to the District.

**District Three** enrollment is approximately 2,314 students and has four schools. Construction is underway for a new elementary school on Highway 245, two miles from the middle school. Construction is likely to be complete in time for next year. The District has received permission to investigate a site for the construction of a new middle school five years from now.

**District Four** enrollment is approximately 2,399 students. Voters in the district passed 2 bond referendums in 1999 to construct a new elementary school and an intermediate school as well as pay for improvements to Swansea High School.

District Five enrollment is approximately 13,000

students and growing rapidly. The District is considering construction of a middle school and elementary school in the Dutch Fork and Chapin area. There are also plans to replace the portable class rooms with permanent structures.

Other significant schools are Midlands Technical College and Wil Lou Gray Opportunity School. Midlands Technical College has 3 metropolitan locations. The two Lexington County locations are Airport Campus, with 16 buildings on 65 acres, and Harbison Campus, with 7 buildings on 19 acres. In addition to technical training programs Midlands Technical College provides specialized training for area businesses and two-year course work that transfers to area colleges and universities. Will Lou Gray Opportunity School campus comprises 87 acres in Springdale. The school serves At-Risk 16,17, and 18 year old high school dropouts in a residential environment. It is home to Youth Challenge Academy, a military style program designed on leadership, teamwork, and self-discipline as taught and modeled within a quasimilitary framework. It is an entity of the state of South Carolina.

In addition to the public school facilities, there al several private and church schools within the county.

#### Museums

#### Lexington County Museum

The Lexington County Museum opened in 1970 as a cooperative effort by Lexington County government and the Lexington County Historical Society. Its purpose is to collect, preserve, display and research objects pertaining to the history of the county. The museum opened in the historic John Fox House, an 1832 home of a local planter and politician, whose two story house had been placed on the National Register of Historic Places. It was purchased by Lexington County in 1969. Located at the intersection of Highway 378 and Fox Street in downtown Lexington the site has expanded to include five acres of land with a modern exhibit building and 15 historic building that have been relocated. Three 1 century log cabins, two early 19th century frame farm houses, a 1790 lawyers' office from Granby Village, an 1815 one room schoolhouse and many outbuildings display numerous artifacts depicting the county's history. The

## SCHOOL LOCATIONS AND DISTRICT BOUNDARIES MAP

[THIS MAP IS AVAILABLE AT THE DEPARTMENT OF PLANNING AND DEVELOPMENT ON THE 5TH FLOOR OF THE LEXINGTON COUNTY ADMINISTRATION BUILDING. IT WILL BE REDUCED IN SIZE TO FIT THIS PAGE AT A FUTURE DATE.] varied collections include an award winning textile collection of quilts and woven coverlets, country furniture, horse drawn vehicles and farm implements. Tours are conducted by costumed guides for of school children and curious adults each year. In fiscal year 1997-1998, there were 11,830 visitors via school tours, non-school tours represented 831, and 1,093 from 'drop-in' visits to the museum. These totaled to 13,754 for that year.

#### **Cayce Museum**

Located in the Cayce City Hall Complex, the Cayce Museum chronicles the history of the first European settlement in the Midlands of South Carolina. The museum interprets the agricultural, social, and cultural heritage of Old Saxe Gotha, Granby, Cayce, and West Columbia. Exhibits emphasize periods of Colonial trade, agricultural development and transportation from the 18th Century to the present. It includes memorabilia of Lord Cornwallis, Commander of British forces in the South, Cayce family furnishings of the 18th century, and exhibits of the Congaree Indians who resided in the area. Original maps of Saxe Gotha Township are on display as well as a detailed sketch of the village of Granby circa 1774. Separate buildings include a kitchen, family dairy, and smoke house appropriate to the era. Numerous groups visit for educational programs and tours.

#### Libraries

The County Public Library System is comprised of a main library, eight branches, and a bookmobile. The library system has undergone tremendous growth in the last several years in response to the rapid growth taking place in Lexington County. As of the spring of 1999 the system comprises 113,000 square feet. Five new buildings have been constructed, a sixth is being renovated, and a seventh is being designed. The library system is fully automated and offers internet and on-line database access at every branch. The larger buildings have meeting rooms that are available for public use. Customers enjoy the benefits of an intra-library and inter-library loan system. Library branches are located in Batesburg-Leesville, Cayce-West Columbia, Chapin, Gaston, Gilbert-Summit, Irmo, Pelion, and Swansea. The main library is in the Town of Lexington. Library use is growing significantly as measured by registered borrowers, reference transactions, group

services, Internet usage, and materials borrowed via interlibrary loan.

#### **Government Facilities**

#### Administration

The Lexington County Administration Building is located at 212 S. Lake Drive (Highway 6 near the intersection with US Highway 1) in the Town of Lexington. The building houses the major government offices including Administration, Communications and EMS, Finance, Tax Assessor, Personnel, Register of Deeds, Planning, Zoning, Building Inspections, Procurement, Auditor, and Treasurer.

The **Lexington County Courthouse** is located at the intersection of S. Lake Dr (SC Highway 6) and Main Street (US Highway 1) in the Town of Lexington.

**Cayce City Hall** is located on 12th Street. The Administrative offices, Planning and Zoning, Public Works, Parks and Solid Waste Departments are located in the City Hall.

Irmo Town Hall is located at 7300 Woodrow Street. The Town Manager's Office, Zoning, and Business License Divisions are located there. Irmo Town Police headquarters are located in the new Younginer Building behind the Town Hall. Irmo has an unusual situation of straddling two counties, Lexington and Richland. County services provided to Irmo's citizens are offered appropriately by each of the counties.

West Columbia City Hall is located at 1053 Center Street in West Columbia. The Zoning, Water and Sewer Administration, Fire and Police Divisions and the City Managers Office are located in the City Hall.

**Springdale Town Hall** is located at 2915 Platt Springs Road. In addition to the Administrator's office, the Town Hall houses the Police Department.

Lexington Town Hall is located on 111 Maiden Lane along with the Police Department, Building Permits, Building/Zoning, Economic Development and Administration.

**Chapin Town Hall** along with the Police Department is located at 103 Columbia Avenue. The other departments in the Town Hall are Utility Director, Municipal Clerk, Clerk of Court, Business License, Zoning, Sign Permits, and Administration.

**Batesburg-Leesville Town Hall** is located at 105 Main Street along with Building Permits, Business Licenses, Sign Permits, and Administration. Police Department, is located at 660 W. Columbia Avenue (US Highway 1).

Swansea Town Hall is located at 300 West Third Street. It houses the Building Permits, Business Licenses, Police (in adjoining building), Administrative, and Sanitation divisions.

**Gaston Town Hall** is located at 186 N. Carlisle Street. In addition to the Administrative office the town hall houses the Police, Building Permits, and Business License division.

**Gilbert Town Hall** is located at 345 Hampton Street. The office is open only during the Town Council meeting hours.

**Summit Town Hall** is located at 321 Old Broad Street. The office is open only during the Town Council meeting hours.

**Pelion Town Hall** is located at 1010 Main Street. Besides the Administrative offices, Town Hall houses the Water Department, Building Permits, and Business License Division.

#### **Public Works**

The **County Public Works** office is located on 440 Ball Park Road. The road maintenance and public works engineering departments are located here. In addition the county has several district maintenance bases.

The **County Solid Waste Division** along with the **County Landfill** are headquartered at 498 Landfill Lane in Lexington.

The **City of Cayce Public Works** administrative office is located within the City Hall. The City of Cayce provides its own water and sewer service.

Some of the jurisdictions in Lexington County do not have a separate Public Works Division but some associated functions are carried out by staff in the town/city halls.

#### Health

The **Lexington County Health Department** is located at 112 West Hospital Drive behind Lexington Medical Center. The department serves the population for adult/child immunizations, environmental health, family planning and other similar functions.

The Lexington Medical Center, located on Sunset Boulevard (US Highway 378) at Interstate 26, has 292 beds with several centers located throughout the county. These centers offer a wide range of services including occupational medicine, urgent and primary care, and various specialty services. Contact he website for more information at http://www.lexmed.com.

#### Social Services

The Lexington County Social Services Department is located at 541 Gibson Street in the Town of Lexington. The department deals with child abuse cases, child protection and various state programs related to family and child issues.

## **POPULATION** ELEMENT

#### **Historic Trends and Projections**

#### Overview

What originally began as a handful of small settlements in 1718, has blossomed into the second-fastest growing county in the state. Major travel routes, the Congaree River, the Charleston to Augusta Railroad, and various trading trails were instrumental in the county's early development. Today, those same factors fuel Lexington County's growth. Located in the Columbia Metropolitan Statistical Area (MSA), with part of the City of Columbia within its borders, two interstate highways traversing its length, and much of beautiful Lake Murray within it, Lexington County offers a wide variety of benefits to both old and new residents.

From 1970 to 1990 the population of Lexington County almost doubled - from 89,012 to 167,600. By the 1990 Census it had the fifth largest population in the state. Lexington County's percentage growth from 1980 to 1990 was the sixth largest in the state at 19.4%. By comparison, the State of South Carolina grew by 11.72% during that same decade.

1998 population estimates by the Bureau of the Census listed Lexington County as having the second highest percentage growth in SC counties from 1990 to 1998 at 22.5%. By comparison, South Carolina was estimated to grow in population by 10% during that time. The only county in the state that had a higher estimated percentage increase was Beaufort County (26.1%). Growth in Lexington County was widely scattered among many developments throughout the county during that time period with even rural areas experiencing growth.

Within the county, the western Dutch Fork area near Lake Murray, the Red Bank area south of the Town of Lexington, and the greater Pelion area in the south central area of the County had the greatest percentage change in population from 1980 to 1990. Areas in the Town of Lexington area and within close proximity to Lake Murray also had significant growth during that decade. In 1990 the Pelion area and the Red Bank area wereboth sparsely populated and rural in character even with the additional growth. The western Dutch Fork area was more densely populated in a suburban growth pattern. While the areas to the south and west of the Town of Lexington were sparsely populated, areas to the east were a little more densely populated. The eastern Dutch Fork area, and areas containing the City of West Columbia and the City of Cayce were densely populated in a more urban fashion.

Lexington County's population projection, by the S.C. Budget and Control Board, Office of Research and Statistics, is expected to be 26.6% growth from 1990 to 2000. This will be the state's highest increase for any county. South Carolina is projected to have a 12.22% percentage growth during the 1990s. The County's percentage growth is projected to be 20.45% from 2000 to 2010 - the fourth largest percentage growth in the state. During that decade the state is projected to have a percentage growth of 10.55%.

Within the county, the areas predicted to have the highest percentage growth from 1990 to 2000 are the Town of Lexington and the Red Bank areas. This continues the trend started in the 1980s. Areas near Lake Murray and in the central part of the County are also predicted to grow significantly in the 1990s. Because the eastern Dutch Fork, West Columbia, and Cayce areas are already densely populated, they are predicted to have slight growth during that time. Densities within the County are predicted to change little except for the Red Bank area which is predicted to become significantly denser from 1990 to 2000.

Much of the growth in the areas around the Town of Lexington can be tied to the expanded provision of water and sewer to those areas by the Lexington County Joint Municipal Water and Sewer Commission and the Town of Lexington. Much of the subdivision growth that occurred before 1980 and even some into the 1990s utilized wells and septic tanks which requires larger lot sizes. Subdivision growth in the mid to late 1990s has been almost entirely where water and sewer are available. This change has meant smaller lots and more lots per subdivision with extremely large subdivisions such as Governor's Grant now a possibility. Planned water and sewer expansions in the Red Bank, Edmund, and Pelio areas along with the Corley Mill Road area will mean more residential and industrial development in those areas in the future.

#### Age

Lexington County's median age in 1990 was 32.6 years. This was a significant change from the median age of 28.7 in 1980. The median age for males was 32.2 years, and median age for females was 33.6 years. The median age in South Carolina in 1990 was 32 years.

In 1990, 28.6% of the population was 25 - 44 years of age, while 12.6% were over 60 years old. The percentage of children 0 to 17 years of age was down from 30.9% in 1980 to 26.6% in 1990. The same segment statewide was 26.4% in 1990. The percentage of retirement age persons (age 65 plus years) was 8.9% in 1990, up from 6.8% in 1980. Statewide the percentage of persons 65 plus years was 11.4% in 1990.

The densely populated West Columbia area had a higher percentage of its population over 65 years of age than other areas of the County in 1990. The suburban Irmo, eastern Dutch Fork, and Red Bank areas had a higher percentage of population 17 years of age or younger. Housing stock in the West Columbia area was older in 1990, with many apartments available, including a good number of subsidized housing units. Housing in the eastern Dutch Fork and Red Bank areas tends to be mid-price single family - often sought by young families.

This information indicates that, as in the rest of the state and the country, the population of Lexington County is getting older. We have relatively fewer children and more retirement age persons each census. Aging baby boomers, fewer children per family, and increased longevity are all factors in this trend. The attractions of Lexington County for retirement - Lake Murray, close proximity to health care, interstate travel options - also contribute to this trend.

#### Race

Lexington County had a largely Caucasian population in 1990 with 87.9% white, 11% black, and only 1.1% of other races (Hispanic, Asian, American Indian, etc.). South Carolina as a whole was much more diverse during the same time period with 69% white, 30% black, and 2% other races. Lexington County was more similar to the United States as a whole in 1990 racially - 80% white, 12% black, but differed dramatically from the 16.6% of other races.

Areas with higher concentrations of blacks in Lexington County in 1990 were in the more urbanized areas of West Columbia and Cayce, and in the BatesburgLeesville area. Areas with the highest concentrations of whites in Lexington County in 1990 were in the Town of Lexington area and a small census tract in the West Columbia area which also has a very high concentration of residents who are 65 years of age or older.

In 1990, 98.5% of Lexington County residents were U.S. natives, as compared to 98.6% of South Carolinians that were U.S. natives. Also, 96.6% of Lexington County residents age 5 years and older spoke only English in 1990. This is almost identical to the 96.5% of South Carolinians age 5 years and older who spoke only English during that same time period.

#### Sex

In 1990, 51.1% of the persons in Lexington County were female and 48.9% were male. This is almost identical to the state of South Carolina at 52% female and 48% male. The United States percentages of female and male were identical to Lexington County in 1990.

According to population estimates by Age and Race in 1996 done by the State Budget & Control Board, Office of Research and Statistics, the percentage of males in Lexington County was greater until the age of 20-24 years, then held steady at 48.9% males and 51.1% females until age 60, when the percentage of females began to increase steadily. This indicates that a higher percentage of our senior citizens in Lexington County are females, while percentages are basically even in younger age groups. This is especially true in residents 75 years and older.

#### Migration

Lexington County had the fifth highest net migration numbers in South Carolina from 1980 to 1990, trailing only Horry, Berkeley, York, and Dorchester Counties. Of the 14,369 net persons who migrated into Lexington County, 83% were white, 17% were nonwhite, 54% were female and 46% were male.

Net migration represents fifty-three percent of the population increase in Lexington County from 1980 to 1990 and 47% was attributed to natural increase (births). In 1990, 68% of the Lexington County population was born in South Carolina. Over half of those born outside of South Carolina were born in the South. Spartanburg County was the only SC county to have a higher percentage of native born citizens in the 1990 Census (among large counties). Estimates for 1999 by the Bureau of the Censusindicate that Lexington County had the highest net migration in the State from 1990 to 1998 at 25,414 persons. By comparison, the next highest net migration was Horry County with 24,460 persons during that same time period. Also 67% of the population increase during that time was attributed to net migration, while only 33% was attributed to natural increase (births and deaths).

#### Household Numbers and Sizes

There were 61,633 households in 1990, with 2.7 persons per household. Of those, 47,274 (76%) were family households, with 3.1 persons per family. Of the family households, 38,822 (82%) of those were married couple families. Of the 14,359 non-family households, 11,622 (81%) were persons who were living alone, and 1,389 persons were in group quarters (nursing homes, group care facilities, etc.).

Within the County, areas with the largest number of persons per household (2.9 or greater) were in the Irmo/ Dutch Fork area and the areas south and west of Cayce. Other areas with large numbers of persons per household were areas that also had large numbers of persons 17 and younger in 1990. Areas with low numbers of persons per household (2.3 or lower) were in the West Columbia area and the eastern Dutch Fork area. Those West Columbia areas had high percentages of population 65 years or older in 1990 and were developed in a more dense urban pattern. The eastern Dutch Fork area had a high percentage of persons 18 to 64 years in 1990 and was developed in a medium density suburban pattern.

The Town of Lexington area had the highest number of persons in group quarters of any area in the County with 629 persons in 1990. This high number can be attributed to several nursing homes (including the former Rikards Nursing Home) and several group housing situations affiliated with Babcock Center.

#### **Educational Levels**

Lexington County had the fourth highest percentage of persons 18 years of age and older that had graduate degrees in the state in 1990 at 6.0%, behind only Richland, Beaufort, and Charleston Counties (S.C. percentage was 4.6% in 1990). It also had the fourth highest percentage of persons 18 years of age and older that had bachelors degrees in the state in 1990 at 13.3% (S.C. percentage was 10.4%). In 1990, Lexington County also had the third lowest percentage of persons 18 years or older with less than a 9<sup>th</sup> grade education in the State at 7.5% (S.C. percentage was 11.8%), and the third lowest percentage of persons of the same age with some high school education but no diploma at 15.3% (S.C. percentage was 18.7%). This indicates a very educated population with a low percentage of persons with little or no high school education.

The County has a very low private school enrollment for grades K-12. This is a result of the excellent quality of the public school system whose individual schools regularly place among the top schools in the State academically at all levels. Lexington County also has a very low percentage of dropouts from grades 9-12, with only 2.5% of students in the 1994-95 school year. The County also had the highest percentage of high school students that went directly into post secondary education after graduating in the State in the Fall of 1995 at 77.2%.

Within Lexington County, the area that has the largest percentages of persons 18 years and older who have bachelors or graduate degrees are in the Irmo/Dutch Fork area. Those areas are developed in a very suburban manner, and are in close proximity to the urban area. Th areas with the highest percentages of persons 18 years and older who have less than a 9<sup>th</sup> grade education are the greater Batesburg/Leesville area and the greater Pelion, Swansea, and Gaston areas. Those areas are very rural in character and much less densely populated, and are much more distant from the urban area.

Although Lexington County has only two satellite campuses of Midlands Technical College - a two year technical institution located within its borders, but it is fortunate to have a wide range of institutions of higher education within close driving range. Newberry College, Allen University, Benedict College, Columbia International University, and Columbia College are all private four year senior colleges that are located nearby. Midlands Technical College's main campus is located within the City of Columbia. Lexington County is fortunate that the University of South Carolina's main campus is in Columbia. This university has an excellent national and international reputation.

#### **Income Characteristics**

Per capita personal income in 1996 was \$21,970. This placed Lexington County as the fifth highest in the state behind Beaufort, Greenville, Richland, and Charleston Counties. Per capita income in 1996 in South Carolina was \$19,898 and \$24,436 in the United States

In 1989, 6.3% of families in Lexington County were below poverty status. This was a decline from 7.6% of families in 1979. 8.4% of persons in Lexington County were below poverty in 1989. A large percentage (14.4%) of those persons were age 65 or older, and a high percentage (33%) were children 17 years or younger. Over twenty six percent of those persons were in female headed household with children 17 years or younger.

Only 6.5% of whites were below poverty level in 1989, but of those 11.9% were age 65 or older. Also, 18.8% were in female headed households with children 17 years or younger. Over twenty four percent of blacks in Lexington County were below poverty level in 1989, and of those 59% were children age 17 or younger, and 40.8% were persons 65 years or older. Almost thirty nine percent of the black population below poverty level were in female headed households with children under 17 years of age.

In 1989, the median personal income was \$21,750 for males, and \$11,613 for females. The median household income for Lexington County was \$32,914, and the median family income was \$37,358. Almost 16% of households made over \$60,000, while 18.5% of households made less than \$15,000 in 1989. In 1989, 19.1% of families made over \$60,000, while 12.4% made less than \$15,000.

In 1998, estimates by the U.S. Dept. Of Housing and Urban Development listed the median income for Lexington and Richland Counties at \$45,600 (the estimate was done by MSA), which ranked behind York County at \$49,600 and Beaufort County at \$47,500.

Within Lexington County, a high percentage of households and families that made \$75,000 or more in 1989 were located in the greater Chapin area, the western Dutch Fork area, the Corley Mill Road area, and the northwestern corner of West Columbia. A large number of households and families that made less than \$30,000 were located in the greater Batesburg/Leesville area, the majority of West Columbia and Cayce, the greater Pelion area south of Red Bank, and the area northwest of Gaston and south of Cayce. The more areas developed into an urban pattern and the more rural areas tended to have households and families with lower incomes. The areas developed in a more suburban pattern - especially around Lake Murray - tended to have much higher incomes. Areas in the center of the County tended to be more middle class in nature.

#### **Health Characteristics**

Kids Count provides a wide array of pertinent data for each county in the state. Kids Count data is offered on the web by The State Budget and Control Board, Office of Research and Statistics, Health and Demographics Section at http://www.orss.state.sc.us/.

Low birthweight babies are often a special concern for the state of South Carolina. Low birthweight of less than 5.5 pounds, and very low birthweight of less than 3.5 pounds, are associated with health risks and growth and development problems. In 1996, 239 or 8.3% of all babies in Lexington County were born with low birthweight: 12% of African-American and Other babies and 7.4% of White babies. During 1994-96, approximately 122 or 1.5% of all babies were born with very low birthweight and had the most serious complications.

Immunization rates are an important indication of whether young children are receiving adequate preventive health care. During FY 1989-90, 58.3% of children less than two years old seen in public health clinics were not fully immunized against such preventable diseases as Polio, Measles, Diphtheria, Tetanus, Haemophilus Influenza B and Whooping Cough. After a concerted statewide campaign to increase immunizations, the percentage of children seen in public health clinics in Lexington County who were not fully immunized had declined to 33% in 1998. The DHEC statewide birth registry survey of all 2 year old children found that 91.9% were fully immunized in 1997-98. This success demonstrates the potential to improve the status of children when the leadership of the state and its communities act decisively together.

# ECONOMIC DEVELOPMENT

#### **Labor Force**

Lexington County's economic growth is one of the forces that fuels the growth of the Columbia Metropolitan Area. The Central Midland counties work together to strengthen the regional economy. Lexington County Council encourages economic growth in collaboration with the Central Carolina Economic Development Alliance. Job creation in Lexington County during the latter half of the 20th century has been remarkable. We have changed from a county with a predominantly farm-oriented economy to a very robust mixed economy of farm, high technology, service industries, health services, and assorted other systems. The unemployment rate for Lexington County continues to be one of the lowest in the state. We continue to be able to expand the number of jobs by population growth and an increasing number of people who commute into the county.

TABLE1

Lexington County Annual Average Labor Force - 1992 To 1998				
Labor Force	Total Employed	Total Unemployed	% of Labor Force	
100,040	95,830	4,210	4.20	
100,850	95,930	4,920	4.90	
106,060	102,300	3,760	3.50	
109,730	106,440	3,290	3.00	
109,440	105,810	3,630	3.32	
114,030	111,260	2,770	2.43	
117,430	115,700	1,730	1.50	
	<b>Labor Force</b> 100,040 100,850 106,060 109,730 109,440 114,030 117,430	Labor ForceTotal Employed100,04095,830100,85095,930106,060102,300109,730106,440109,440105,810114,030111,260117,430115,700	Labor ForceTotal EmployedTotal Unemployed100,04095,8304,210100,85095,9304,920106,060102,3003,760109,730106,4403,290109,440105,8103,630114,030111,2602,770117,430115,7001,730	

Source: South Carolina Employment Security Commission, Labor Market Division, 1999

The resulting growth in the Columbia Metropolitan Region has brought about development in many of Lexington County's service-related industries, including business and personal services, construction, finance, government and retail trades. All sectors have undergone significant increases within the past few decades. Lexington County presently has a well balanced, diversified labor force with the trade sector being the largest employee group with 20500, followed by services with 14800, and manufacturing with 12800.



#### Lexington County Unemployment Rate



·	TABLE 3				_
-Farm Employ	ment Chang	es By Indus	try		
<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1995</u>	<u>1996</u>	
2400	4200	8200	13100	12800	
500	800	1500	5500	6000	
700	800	1000	5100	5300	
900	1600	3400	19300	20500	
100	200	400	2000	2000	
600	700	1700	13700	14800	
1300	1800	2600	10800	11500	
12100	15340	24000	69400	72900	
	<b>1-Farm Employ</b> <b>1950</b> 2400 500 700 900 100 600 1300 12100	TABLE3   I-Farm Employment Chang   1950 1960   2400 4200   500 800   700 800   900 1600   100 200   600 700   1300 1800   12100 15340	TABLE 3   Farm Employment Changes By Indus   1950 1960 1970   2400 4200 8200   500 800 1500   700 800 1000   900 1600 3400   100 200 400   100 1000 2600   12100 15340 24000	TABLE 3   Farm Employment Changes By Industry   1950 1960 1970 1995   2400 4200 8200 13100   500 800 1500 5500   700 800 1000 5100   900 1600 3400 19300   100 200 400 2000   100 100 13700 13700   1300 1800 2600 10800   12100 15340 24000 69400	TABLE3   Farm Employment Changes By Industry   1950 1960 1970 1995 1996   2400 4200 8200 13100 12800   500 800 1500 5500 6000   700 800 1000 5100 5300   900 1600 3400 19300 20500   100 200 400 2000 2000   100 1800 2600 10800 11500   12100 15340 24000 69400 72900

Source: S.C. Employment Security Commission, Labor Market Division. 1995-97

Lexington County's labor force has undergone some significant changes over the past fifty years. Lexington County has emerged from its predominantly agricultural past into a well balanced, diversified economy. The county enjoys a strategic location in terms of market access and accessibility, a positive economic development climate, an expanding infrastructure, excellent school systems, and a high quality of living. All this makes Lexington County an attractive place to live, work and do business. Industrial growth fuels the growth in many other sectors such as trade, services, and government. Central Carolina Economic Development Alliance lists the four largest private sector employers as, Allied Signal (1332), Michelin Tire Corp. (1300), NCR Corp. (952), and Union Switch & Signal (500), respectively. Expansion of existing industries such as Michelin, (1997) and the opening of the United Parcel Service's southeast regional air cargo hub, (July 1994) have added significantly to Lexington County's growing economy.

The following farm related statistics clarify how important farming is in Lexington County. Lexington County ranks third in the state in total cash receipts from farm products. There are 94,200 acres of farmland in the county divided among 820 farms. The average farm size is 115 acres. Total receipts from farming were \$81,182,000 in 1994. The number one crop in terms of planted acres is hay. The county ranks number one in vitamin A production, i.e. leafy green vegetables.

Table 5 shows the commuting patterns for workers living in Lexington County. Although Lexington County's economy is still closely tied to the Columbia Metropolitan Area's economy it is clear that it has emerged as a major employment center itself, with 19,456 workers commuting into the county, and 44,885 residents commuting out of the county.

#### TABLE 5

#### 1990 Worker Communting Patterns

Lexington County, South Carolina

In fro	om Co	unty

Abbeville	2	
Aiken	707	
Anderson	9	
Bamberg	15	
Barnwell	62	
Beaufort	35	
Berkley	31	
Calhoun	781	
Charleston	62	
Chester	10	
Clarendon	62	
Kershaw	355	
Lancaster	35	
Laurens	33	•
Lee	25	
Marlboro	7	
Newberry	710	
Orangeburg	811	
Pickens	17	
Richland	13,330	
Saluda	1,365	
Spartanburg	.39	
Sumter	120	
Union	16	
York	34	
Columbia,Ga	17	
Effingham, Ga	7	
McDuffie, Ga	2	
Richmond, Ga	21	

<b>Out from County</b>		
Abbeville	6	
Aiken	637	
Allendale	8	
Anderson	41	
Bamberg	14	
Barnwell	55	
Beaufort	38	
Berkley	20	
Calhoun	226	
Charleston	220	
Cherokee	6	
Greenville	95	
Greenwood	22	
Hampton	10	
Hony	50	
Kershaw	187	
Laurens	29	
Lee	5	
Marion	11	
McCormick	2	
Newberry	383	
Oconee	16	
Orangeburg	435	
Pickens	17	
Richland	40,045	
Saluda	243	
Spartanburg	60	
Sumter	180	
Williamsburg	· 39	

# HOUSING ELEMENT

The growth of residential housings in Lexington County has been phenomenal for the last 20 years. The population has grown from 89,012 in 1970 to an estimated 205,260 in 1998. The housing industry has experienced a boom that has affected all sectors of the housing market. The county has new upscale developments that include many homes presented in the media for the special visual effects and features. At the same time the county has a few areas of manufactured housing that are accessible only by 4 wheel drive vehicles. This difference in housing options and values is a topic of conversation in the county. The general concerns are for adequate, safe, affordable housing for our citizens.

Because of the continuing population growth Lexington County real estate is a sound investment. The cost of housing has remained below the state and national average.

A major driving force for the continued growth in the number of housing units and the variety of subdivisions is the high reputation of the Lexington County schools. Other prime factors in the growth of the county are the diversity of work choices available, the proximity to Lake Murray, the lifestyle afforded in the different regions of the county - from 'scenic rural' to 'small town' to 'suburban' or even to 'downtown.'

In the past twenty years the type of residential structures built in Lexington County has shifted. In the 1970s the majority of new houses were site built. In the 1990s the balance of new houses shifted to more of a balance of traditional site built houses and manufactured home. As chart 2 shows there has been a definite change in the proportion of building permits issued.

According to a housing permit study for 1975-1996 (Central Midlands Council of Governments) Lexington County's percentage of the Columbia MSA housing has ranged from 59% to 38%. Using 5 year sections the general impression is that Lexington County is providing a decreasing percentage of the new housing starts over this time period. However this also reflects a growing region for housing starts because the number of new housing units has gradually increased if measured by 5 year increments.


# MAP OF BUILDING PERMITS

WE HAVE 5 YEARS OF ADDRESSED-BASED DATA ON SITE-BUILT & MANUFACTURED HOUSING MAPPED. IT IS AVAILABLE AT THE DEPARTMENT OF PLANNING AND DEVELOPMENT ON THE 5TH FLOOR OF THE COUNTY ADMINISTRATION BUILDING.

# ELEMENT

# **Overview**

Given the vast area under the jurisdiction of Lexington County, the land use element of the comprehensive plan will be generalized in its approach. Currently there are over 110,000 parcels located in the 700 square mile area that comprises Lexington County. The county's land use patterns are extremely diverse from the metropolitan urbanized areas of West Columbia and Irmo to the rural agricultural sections in the western and southern portions of the county.

The land use component examines the existing land use patterns and future land use needs by category including residential, commercial, industrial, and institutional. These categories do not minimize the importance of agriculture as a vital element in Lexington County's present and future. Currently farm land represents 21% of the land in Lexington County. As noted in the economic development element, Lexington County is a strong center for agriculture. However, as the population grows there are pressures to plant houses rather than crops. Planning, public education, and cooperation will be key to emphasizing farming interests and growing population. Future land use patterns will be influenced by the inventory of the other components discussed in previous sections (population, economy, cultural resources, community facilities, natural resources, and housing). The findings from this complete inventory will serve as a guide for decisions about the amount of land that is needed for the different land uses.

The primary factors that are expected to influence future land use are school districts, available land, transportation, the natural beauty of the county, and a continuing growing economy. Families will continue to move into Lexington County in order to place their children in Lexington County schools. Land will continue to be available for development for a variety of uses for several decades. We have three interstate highways and numerous multi-lane highways that make travel to and from work locations reasonable. Lake Murray and other naturally beautiful areas of the county will attract developers who want to place their houseinto a setting that has a pleasant

ambience. The diversified economy of farm, hightechnology, services, and commercial activity should continue unless a serious national alteration in the economy occurs. Mix into this array of attractions the growth of the other quality of life issues, e.g. health care, constructed recreation activities (as differentiated from natural beauty of the county), support systems, public and private institutions and you have a synergy for continued growth. For example, Lexington County government realized the need for expanded library services for the growing population and guided the improvement to the entire library system. Lexington Medical Center now offers locations throughout the county for both geographical and specialization needs. Major industrial sites are already located in a variety of areas of the county.

Beyond the items noted above, Lexington County has a blend of zoning styles that will encourage a quality of growth in the years to come that enhances life choices. Performance based zoning creates a bond of both the individual's choice of land use and respect for the privacy of others. It allows mixed use of land such that long trips are not as necessary for many routine errands. Developers will continue to be challenged to meet the needs of the purchasing public with genuine concerns for the responsible extension of water and sewer services.

Historically, there has been a formal planning process for development in the county for 25 years. Still it is the market forces that have the most influence on what is developed here. The role of a document like this one is to serve as a guide in the decision making process thus avoiding a land use pattern that is random and sporadic in nature. The Land Use Map shows the existing land uses for the county, which is predominantly rural to suburban, characterized by small corridor pockets of commercial areas.

#### Residential

Low density, single family housing is the dominant type of housing in Lexington County. It is interspersed throughout the county and generally clustered in neighborhoods. Residential housing ranges from older housing units that were farm houses or 'starter' houses for young families to elegant large houses crafted to fit the exact topography on the lake or along the river. Many new subdivisions have been added in the last twenty years that appeal to persons who are relocating with high expectations of both the house and community.

# EXISTING LAND USE MAP

[THIS MAP IS AVAILABLE AT THE DEPARTMENT OF PLANNING AND DEVELOPMENT ON THE 5TH FLOOR OF THE LEXINGTON COUNTY ADMINISTRATION BUILDING. IT WILL BE REDUCED IN SIZE TO FIT THIS PAGE AT A FUTURE DATE.]

Mobile homes make up a significant portion of the residential land uses. The growing trend for mobile home parks is located primarily in the rural areas throughout the county. Three maps show the dispersion of housing by building type for the past three years. By examining the number of building permits one can see that new mobile homes are locating in the county at a generally increasing rate. The change in growth pattern of site built houses and mobile homes in 1998 bears watching. It may be that mobile homes hit a peak vs. site built houses in 1997. It may be that 1998 was the reflection of the low loan rates nationally translated into site built houses. In 1960 mobile homes accounted for only 2.5% of the total housing units in the county and 1.7% for the state. In 1990 the numbers of mobile homes had grown significantly to 20.4% for Lexington County and 17.8% for the state. In 1997 51.0% of the residential building permits issued for Lexington County were for manufactured housing. Approximately 60% of these were for sectional or doublewide homes while 40% were for the single wide variety. The reasons behind this increase in manufactured housing can be traced to several factors including: cost, availability and ease of home ownership. While the debate over the pros and cons over the mobile home will continue for the years to come, they are a significant option for housing in the county. A further consideration is the growth of modular houses throughout the nation as an alternative to both mobile homes and site built houses.

#### Commercial

Existing commercial uses are focused primarily along major arterials and at the major interchanges along I-26 and to a lesser extent I-20. Particularly commercial activity in the Harbison Boulevard area has increased significantly in the 1990s. This expansion has been largely a response to change in the residential patterns over the last 25 years. This foci of commercial activity includes Columbiana Centre (mall), several 'big box' store strips, home improvement centers, specialized businesses, and a wide variety of restaurants and motels.

#### Industrial

The major areas of current new industrial sites are along the major transportation routes. Interstate highways (I-77, I-26 and I-20), railroads, major highways, and the airport are key indications for location of new industry. The transportation zones are ranged throughout the county. This spatial dispersion makes it appropriate for workersto live in many different neighborhoods in the county. Unlike some counties which have targeted only a few areas for industrial sites Lexington County is fortunate that the economic developers and industries focused their efforts in many different parts of the county for industrial development. Within the smaller focus of industrial dispersion many of the industries are generally in the same vicinity.

#### Institutional

The growth of institutional site in the county parallels the growth of the population as a whole in many ways. There are some instances of institutional sites that are simply located here. For example, Will Lou Gray Opportunity School is a state school located in Lexington County that is not dependent upon the population of the county for future growth. On the other hand, SC Vocational Rehabilitation facilities in West Columbia may grow due the increasing population of the state and the range of services provided. School districts are continuing to construct new school campuses in response to the growth in the population. Medical and government services have expanded and will continue to do so in response to the needs of the people. Simply the expansion of the number of Emergency Services locations throughout the county over the last 3 decades is witness to what must happen in the next few decades.

Non-profit institutional sites are expanding in response to the dramatic population expansion during the last 30 years in Lexington County. The number of churches and the size of the church plants is increasing. This growth is evident both in developed areas and in those neighborhoods that are starting to grow. Other facilities for specialized segments of the population are also expected to expand. As the population changes more and a greater diversity of services will be provided for senior adults, persons with specific needs, and those with specialized interests.

# **Future Land Use Patterns**

The future character of Lexington County will be influenced by land use patterns that occur while this plan is being implemented. The distribution of land uses will help to define neighborhoods, create business districts, and create an overall cohesive relationship between different types of land uses. From an optimistic viewpoint the county will continue to experience population growth, industrial and commercial expansion, strong agricultural activity, and institutional development. These factors will mirror the response of those who choose to make Lexington County home. If on the other hand, a major national economic downturn occurs then the county will not continue to grow as it has in the last 30 years. Growth will be slower, less robust, and be determined by forces that we cannot plan for at this time.

#### Residential

Projected population growth will necessitate an increase in dwelling units during the first decade of the 21st century. The number of single and multifamily housing units, including apartments, duplexes, and townhouses, is likely to increase as the variety of growth generators continues to thrive in Lexington County.

The majority of current single family uses will continue to be the site built home and the mobile home. Other single family choices will likely take a larger portion of the market share but still be relatively small number of the total single family homes. Most of the new low density residential development will utilize undeveloped parcels adjacent to the urban growth corridors. Much of this will take place in the center and southern parts of the county. The Lake Murray growth zone will thrive as long as there are lakefront lots, lake access lots, and housing developments that promise the combination of the lake and Lexington schools culture.

Some existing low density residential areas will shift to more high density residential or neighborhood commercial uses. There are numerous areas with potential for infill development. Many small subdivisions will be built in the central and southern parts of the county. Large scale subdivisions will be guided by school sites, available land, and developers.

#### Commercial

The Harbison Boulevard area will continue to be a major focal point of commercial activity for the Metropolitan Statistical Area. New commercial property is still being developed there at the end of 1999. Future developments of restaurants, hotels, and other businesses will complement hose major attractions already in the Harbison Boulevard area. Other commercial activity centers will thrive along major transportation routes, such as US Highway 378 between West Columbia and Lexington, Highway 6 in Red Bank area, US Highway 1 between West Columbia and Lexington, US Highway 378 beyond Lexington toward Saluda County. Other commercial activity centers will develop throughout the central area of the county as housing concentrations justify the expansion into those areas. Each of the cities in the county will likely see increased commercial activity during the next decade.

#### Industrial

The continued expansion of industrial site along major sources of transportation will continue during the next decade. Current areas of significant industrialization will continue to thrive, e.g. the area around the Columbia Metropolitan Airport, and the interstate highway corridors. If school funding continues to depend heavily on local taxes then the Lexington County Council will continue to target new industrial sites into the various school districts. This plan places the opportunity of tax support into each of the county school districts.

#### Institutional

As the population continues to grow numerically and expand geographically throughout the county the institutional sites will expand in tandem. Government service sites will be acquired to provide the basic services that citizens want and need. Special centers will be built to accommodate those in need of particular or general health services, social services, and other needs. Churches, schools, and other recreational centers will be constructed for those in the growing areas. The two county recreational groups will target those areas which must have new or expanded recreational facilities for the ageing, youth, children or general population.

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# APPENDIX A

# HISTORIC SITES AND STRUCTURES ON THE NATIONAL HISTORIC REGISTER, LEXINGTON COUNTY

Register Number	Name of Structure	Dated
83003858	Ballentine Shealy House	-
83003911	Lybrand Henry Farm	1835
83003875	Dreher-Jacob Wingard House	1830
83003904	Hendrix John House	-
80003677	Mt. Hebron Temperance House	1862
87001988	Gunters-Summers House	1895
83003921	Still Hopes	1910
83003879	Griffith David Jefferson House	1896
83003918	Music Hall Evangelical Lutheran Church	1892
83003923	Wessinger Vastine House	
77001230	Berly William House	1904
83003870	Berly W.Q.M House	1904
70000873	Fox House	1832
77001231	Boozer Lemuel House	1828
83003914	Rauch Charleston House	1886
83003903	James Harmon Building	-
83003909	Home National Bank	1912
83003922	Timmerman Law Office	1835
83003872	C.E. Corley House	1895
83003877	Georges Grist and Flour Mill	1924
83003860	Bank of Western Carolina	1912
83003915	David Rawl House	1854
83003917	James Stewart House	1850
83003908	Hite John Jacobs Farm	1870
8300866	Bar D.D.D House	1859
82003887	Rev. Walter Herbert House	1878
82003892	Rev. Frank Yarborough House	1906
82003885	Hampton Hendrix Office	-
82003890	Mitchell Cromwell House	1885
82003893	Old Batesburg-Leesville High School	1920
82003891	Mitchell Shealy House	1855
82003878	Hartley House	1830
83002201	Old Batesburg Grade School	1912
83002202	Southern Railway Depot	1900
82003879	Cartledge House	-
82003876	Edward Bouknight House	-
82003888	Holman J. B. House	1910
32003877	Edwards Broadus House	1905
82003883	Rawl Crouch House	1893
82003881	Mitchell McKendrea House	-
82002202	A.C. Jones House	-

# **APPENDIX B**

# UNIQUE OR SIGNIFICANT NATURAL AREAS AND VIEWS, LEXINGTON COUNTY

<b>Site Name</b> Peachtree Rock	<b>Location</b> S.E. of Edmunds near SC 215	Acreage 300	<b>Significance</b> Rare geologic outcrop & plant species
Lower Saluda River	1 mi. below Lake Murray	10 miles	Designated State Scenic to confluence with Broad River
Shealy's Pond	West of Edmund near SC 215 & SC 6	62	Designated Heritage Preserve
Poole's Woods	Near Orangeburg County Line	60	Primitive forest area
Lucas Millpond	Near Scouter Creek	45	Significant forest stand and bog
Harmon Woods	Adjacent Lake Murray	210	Significant forest stand
White Cedar	Near the intersection of Secondary Roads 116 & 118	100+	Primitive forest & swamp

Sec 2.2 Ref 4

7

# COMPREHENSIVE PLAN

SCEG-155

# NEWBERRY COUNTY

1998

#### PREPARED BY CENTRAL MIDLANDS COUNCIL OF GOVERNMENTS

#### ADOPTED

City of Newberry Town of Pomaria Newberry County Town of Whitmire Town of Peak Town of Prosperity Town of Little Mountain Town of Silverstreet January 12, 1999 February 1, 1999 February 3, 1999 February 8, 1999 February 9, 1999 February 16, 1999 March 16, 1999

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# COMPREHENSIVE PLAN NEWBERRY COUNTY, SOUTH CAROLINA

#### THE GOALS AND FORMAT OF THE COMPREHENSIVE PLAN

Newberry County and its municipalities have expressed long-standing interest in community planning and development.<sup>1</sup> In 1970, the Newberry County Planning Commission, assisted by the Division of Community Affairs within the Office of the Governor, prepared a <u>Development Plan for Newberry County</u> as well as all municipalities except the City of Newberry. That document was updated in June 1976, and again in early 1990 only for the unincorporated county. Separate land development plans have been completed for the Towns of Whitmire and Prosperity since 1970.

In 1997, all incorporated municipalities and Newberry County agreed to coordinate their interests in planning for the new millennium by creating a Newberry County Joint Planning Commission. This new body, established by ordinance, has 24 members. It has been empowered by the "South Carolina Local Government Comprehensive Planning Enabling Act" of 1994 to maintain a continuous planning program. Thus, it can ensure citizens in each governmental jurisdiction that (1) various land development will occur in an orderly fashion by means of non-intrusive land development ordinances (2) ensure that land uses are properly located in relationship to one another, and (3) governmental units such as school districts, utility authorities, and general purpose local governments coordinate to solve problems. That law comprises Sections 6-29-310 through 6-29-1200 of the <u>S. C. Code of Laws</u> and is the legal foundation of the Newberry County Comprehensive Plan. All counties and municipalities are charged with making their plans and land use related ordinances conform with the provisions of the new enabling legislation by May 3, 1999.

The Joint Planning Commission (JPC) has prepared this comprehensive plan by analyzing existing conditions in the following elements:

i

<sup>&</sup>lt;sup>1</sup> Ambrose E. Gonzales wrote the following of the City of Newberry in the <u>Charleston News and Courier</u>, February 21, 1889. "Newberry is handsomely laid out, and the streets, many of them macadamized and all of them are provided with excellent sidewalks. Most of the businesses are clustered around the public square, and the solid blocks of buildings present quite a metropolitan appearance."

Population Housing Economic Development Natural Resources Cultural and Historical Factors Community Facilities Land Use

Each of these elements comprises a separate chapter. Each element will be divided into two parts: an inventory of existing conditions and a second being a statement of needs and goals.

Implementation strategies with time frames will comprise an eighth chapter. The inventory of existing conditions will cover all points specified in state planning enabling legislation for each unit of government participating in the JPC. The purpose of the existing conditions data and analysis will be an understanding of present conditions in Newberry County and the local general purpose governments as well as their future growth potential.

Needs and goals for each element will include identification of any problems or challenges that need attention as well identification of needs to be accomplished during the planning period.

Information contained in the seven elements will be the basis of implementation strategies specified in Chapter 8. Development of these strategies will include specific objectives and strategies indicated in the inventory of existing conditions and then confirmed in the statement of needs and goals. Where possible, action steps with timetables will be included with the lead persons and organizations identified.

In order for this document to be the official plan of each local government participating in its preparation, it will need to specifically address the situation of local governments where their situations are unique. To that end, all sections of the plan will address as needed the special situation/conditions in each local government. Chapter 7 will contain existing and future land use maps of each town. Chapter 8 will include implementation strategies for each local government. Moreover, a principal value of this comprehensive planning approach is that the plans for each local government shall be consistent with

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the plan for the entire county. After Chapters 7 and 8 have been prepared, copies of the plan draft shall be sent to each municipality for their review and input. Where local governments are near completion of their local land development plans, these documents shall be included in the Newberry County Comprehensive Plan by reference.

#### INTRODUCTION

The lives and prosperity of the residents of Newberry County have been and will continue to be linked by railroad and road access to jobs and markets, for it is by these means that the county was initially settled and its subsequent well-being developed. The first European and African settlers relied on expansions of Native American trails from the mountains to the coast to trade their produce for staples, tools, and clothing. Principal use of the land by small, independent householders was for farming. Not until the completion of the Columbia/Greenville Railroad to Newberry in the early 1850s were small landholders able to grow and sell cotton profitably. In fact, from 1851 forward, no town in the county grew and was even established away from a railroad line. Little Mountain, Prosperity, Silverstreet, and Chappells all were established and then incorporated along the new rail line. The development of cotton mills in Whitmire and Newberry owed as much to the availability of the new railroad as to the fertile soils of the county.

The extensive cultivation and milling of cotton made possible by railroad access to distant markets was a mainstay of the economy until the coming of the boll weevil in 1920 and the subsequent depression caused a setback in the local economy. In fact, from 1920 to 1940 the population of the county declined by more than 2,000 persons and continued declining until the decade of the 1970s. The <u>S. C. Statistical Abstract</u> reported no commercial cotton cultivation in 1994.

Construction of federal-aid primary highways beginning in the 1930s was critical to arresting economic decline in the county as agriculture diminished as a way of life in the county. So bleak were agricultural fortunes in the county by the early 1930s, the U. S. Department of Agricultural was able to purchase 55,505 acres at prices below \$4 per acre for the Enoree Division of the Sumter National Forest. Smallholders could not contend against nature and the Depression. Beginning with U. S. 76 and then with U. S. 176, the county had all-weather concrete surfaced roads linking it with Greenville and Columbia and beyond. Then, in 1961, Interstate 26 was completed across the county. This four-lane, limited access freeway helped civic leaders in Newberry County attract new businesses such as Owens-Illinois, etc.

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Since the early 1960s, the Interstate has made commuting to Columbia and the upper Piedmont more feasible for commuters. They easily drive outside the county to work and then bring their paychecks home. Moreover, industrial recruiters are now developing a new industrial park near the interchange of I-26/S.C. 219 to attract companies worldwide. To improve the economic value of I-26, the county is examining development of another interchange giving Prosperity better access west of S. C. 773.

Newberry County's economic prosperity has declined since 1980<sup>2</sup>. Reversal of that decline will depend on the skill with which civic leaders can maximize the county's human resources potential, its historical/cultural resources, its geographic position between Greenville and Columbia, and its excellent transportation network. It is the goal of the Newberry County Joint Planning Commission to inventory its resources, determine goals and objectives for the county, and specify common sense strategies to enable the County to thrive in the next century. That the county and its municipalities should grow in terms of population and land development without suffering from negative byproducts of growth is also a key mission of the Joint Planning Commission.

<sup>2</sup>James C. Hite, et al., <u>Fighting Back: The Newberry County Economy in the Late 20th Century</u>, Strom Thurmond Institute, Clemson University, Clemson, S. C., 1995.

#### CHAPTER 1

#### POPULATION ELEMENT

The population element of the Comprehensive Plan presents information on the people residing in Newberry County and participating municipalities. This Chapter includes information on the number of people, population trends, selected characteristics of the population, and population projections.

#### A. Newberry County

#### 1. Inventory

As Table P-1 shows, the total population for Newberry County based on the 1990 Census was 33,172. The table also shows that 14,107 (42%) of the residents of Newberry County live in the incorporated areas of the county. There are 630.8 square miles in the county. Subtracting 15.1 square miles, which is the total number of square miles for all of the incorporated areas, leaves a total of 615.7 square miles of land in the unincorporated area. That calculates to a density of 34 people per square mile in the unincorporated area of the county.

#### TABLE P-1

#### TOTAL 1990 POPULATION FOR NEWBERRY COUNTY AND MUNICIPALITIES Source: Information Collected from U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>Total</u>	Percent
Newberry County	33,172	100%
City of Newberry	10,539	31.7%
Town of Little Mountain	241	.7%
Town of Peak	74	.2%
Town of Pomaria	272	.8%
Town of Prosperity	1,114	3.4%
Town of Silverstreet	165	.5%
Town of Whitmire	1,702	5.1%

Table P-2 provides a breakdown of the county population by age, race and gender. As a reflection of the overall increase in population, most of the categories saw an increase in population as well. Below is an analysis of the population by category for 1980 and 1990. The chart includes data from 1970 for a comparison.

**Race:** The most significant change was an increase of 59 people in the classification "other." While the total number is only .4% of the total population of the county, the trend in the increase of other ethnic groups should continue in relation to the growth of industry.

> Two other significant trends were the increase in the white and the black populations. Overall, the white population increased by only 198 people, yet in every age category except those over 65, the white population declined. Conversely the black population increased overall, and in every age category.

Age:

The overall totals for the county indicate significant growth in those over the age of 65. The only categories where this was not the case were the black population where those under the age of 5 increased by 300, and the classification "other" where those between the ages of 15 and 59 increased by 52.

Gender:

In 1990 as in 1980, there were more females than males in the county (17,365 to 15,807). Additionally, the percentage change in the population of females was greater than the change in males, so the female population is growing at a faster rate as well.

#### TABLE P-2

# SELECTED POPULATION DEMOGRAPHICS NEWBERRY COUNTY

Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File 1970 Data found in Bureau of the Census Characteristics of the Population part 42 South Carolina

			Change	
	<u>1990</u>	<u>1980</u>	<u>'80-'90</u>	<u> 1970 </u>
Land Area (Square Miles)	630.8			
Persons per Square Mile	53			
Total	33,172	31,242	+1,930	29,273
<5 years	2,247	2,018	+229	2,299
5-14 years	4,639	4,787	-148	5,521
15-59 years	19,654	18,473	+1,181	16,599
60-64 years	1,509	1,506	+3	1,509
65+ years	5,123	4,458	+665	3,345
Male	15,807	15,080	+727	14,127
<5 years	1,155	1,035	+120	1,129
5-14 years	2,345	2,413	-68	2,847
15-59 years	9,685	9,149	+536	8,137
60-64 years	696	680	+16	649
65+ years	1,926	1,803	+123	1,365
Female	17,365	16,162	+1,203	15,146
<5 years	1,092	983	+109	1,170
5-14 years	2,294	2,374	-80	2,674
15–59 years	9,969	9,324	+645	8,462
60-64 years	813	826	-13	860
65+ years	3,197	2,655	+542	1,980
White	21,492	21,294	+198	19,574
<5 years	1,148	1,237	-89	1,225
5-14 years	2,641	2,831	-190	3,156
15-59 years	12,560	12,720	-160	11,589
60-64 years	1,160	1,188	-28	1,154
65+ years	3,983	3,318	+665	2,450
Black	11,557	9,884	+1,673	9,684
<5 years	1,081	781	+300	1,073
5-14 years	1,988	1,938	+50	2,364
15-59 years	7,013	5,724	+1,289	5,001
60-64 years	335	318	+17	354
65+ years	1,140	1,123	+17	892
Other	123	64	+59	
<5 years	18	0	+18	•

5-14 years	10	18	-8
15-59 years	.81	29	+52
60-64 years	14	0	+14
65+ years	0	17	-17

Table P-3 shows a breakdown of the county's population by census tract. Further discussion about each census tract can be found within each discussion of the municipalities. It should be noted that the only census tract that does not have direct access to I-26 is tract number 9504.00, which also has the smallest population. This is also the only tract which does not contain a municipality.

#### TABLE P-3

#### SELECTED 1990 POPULATION DEMOGRAPHICS BY CENSUS TRACT FOR NEWBERRY COUNTY Source: <u>Population and Housing Characteristics by Census Tract</u> Prepared by Central Midlands Regional Planning Council, January 1993 and 1990 Census of Population and Housing Summary Tape File 3A

Tract	<u>Total</u>	<b>Incorporated Areas</b>	Unincorporated Area
9501.00	3,278	272	3,006
9502.00	7,900	5,395	2,505
9503.00	3,906	1,702	2,204
9504.00	940	0	940
9505.00	9,419	5,309	4,110
9506.00	7,729	1,429	6,300
Total	33,172	13,936	19,236

Table P-4 illustrates selected family demographics for Newberry County. The most significant trend was the increase in every type of single headed family, especially those with children. This is in contrast with a decrease in the number of married couples with children. The other significant trend was the increase by 313 of number of those 65 and older living alone. This segment of the population has unique health and social needs that will need to be addressed by the county. For the purpose of Table P-4, the category "Non-Family" is defined as 2 or more unrelated people living in the same household.

#### TABLE P-4

# SELECTED HOUSEHOLD DEMOGRAPHICS NEWBERRY COUNTY

#### Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>	<u>1980</u>	Actual Change
Total Households	12,363	11,002	+1,361
Family	9,148	8,458	+690
Married Couple	6,884	6,879	+5
W/Children	3,030	3,179	-149
W/O Children	3,854	3,700	+154
Single Headed	2,264	1,579	+685
W/Children	1,133	741	+392
W/O Children	1,131	838	+293
Males, No Wife	490	329	+161
W/Children	177	99	+78
W/O Children	313	230	+83
Female, No Husband	1,774	1,250	+524
W/ Children	956	642	+314
W/O Children	818	608	+210
Non-family	3,215	2,544	+671
65+ Living Alone	1,614	1,301	+313

<u>Population Projections</u>: Table P-5 shows population projections for the county. Even though population is projected to increase, the population of those under 24 is projected to decrease. This indicates a gradually aging population of the county.

#### **TABLE P-5**

#### POPULATION PROJECTIONS FOR NEWBERRY COUNTY Source: <u>Selected Statistics Central Midlands Region</u> Prepared by Central Midlands Council of Governments August 1997

	<u>1990</u>	<u>2000</u>	2005	2010	Change 1990-2010
Total	33,172	35,100	35,900	36,300	+3,128
<5 years	2,244	2,320	2,170	2,070	-174
5-17 years	6,132	6,320	6,150	5,910	-222
18-24 years	3,550	3,080	3,510	3,360	-190
25-64 years	16,123	17,902	18,374	18,960	+2,837

65+ years	5,123	5,478	5,696	6,000	+877

Based on the projections in Table P-6 every census tract will see a growth in population, however, most of the growth in Newberry County will be in census tract 9506.00. The growth in this census tract will be influenced by the development along Lake Murray, the growth of Prosperity and Little Mountain, and access to I-26. Census tract 9502.00 will see the second largest increase in population, primarily due to the growth in the City of Newberry towards I-26.

#### TABLE P-6 POPULATION PROJECTIONS BY CENSUS TRACT FOR NEWBERRY COUNTY Source: <u>Selected Statistics Central Midlands Region</u> Prepared by Central Midlands Council of Governments August 1997

<u>2000</u> Tract 1990 2005 2010 2015 1990-2015 9501.00 3,278 3,470 3,535 3,585 3.365 +3579502.00 7,900 8,435 8,610 8,710 8,710 +860 9503.00 3,906 4.090 4,110 4,125 4,125 +2449504.00 940 1,045 1,135 1,185 1.235 +2959505.00 9.419 9,845 9,945 10,000 10,030 +611 9506.00 7,729 8,215 8,565 8,695 8,790 +1,061

#### 2. Needs and Goals

As the population projections show, the county's population should continue to grow gradually through the first decade of the next millennium. With a commitment to expand infrastructure, and an aggressive stance in attracting new industry, the county could very easily exceed the projections in Table P-5. As the projections show, however, there will be increase in the elderly population. The increase in those over the age of 65 will require the county and municipalities to develop and implement programs in all areas of service which are sensitive to this group's needs.

<u>Goal for Newberry County</u>: The primary goal for the population element is to meet or exceed the population projections in Table P-5. As a part of this goal, the county should strive to attract younger residents. A younger, more educated work force will be key to attracting new industry to the county. Additionally, the county should be aware of the changing demographics of the population. The increase in single parent families, those over the age 65, and an immigrant population will require the county to reevaluate services that meet the needs of these growing segments of the population.

#### B. Town of Peak

#### 1. Inventory

The 1990 population of Peak was 74, which was .2% of Newberry County's population, and

1.0% of the population of Census Tract 9506.00 where Peak is located. The area of the town is .3 square mile. As Table P-7 shows, the town's population declined by 7 people between 1980 and 1990. According to the statistics, all 7 of the people were male. A discussion of the age, race and gender categories follows.

Age: Overall, the age of the population is increasing. The number of people between the ages of 5 and 59 declined by 20, while the number of people over the age of 60 increased by 9. There was an increase of 4 people under the age of 5.

Race: Contrary to the county's population, the number of white people increased by 18 while the number of black people decreased by 25. There were no residents classified as "other" in the town.

Gender: The number of females was unchanged over the ten year period, while the number of males declined by 7. The aging population is most significant among the male population- every age group, except those over 65, decreased. In contrast, the population of females under 5 increased by 4.

# TABLE P-7 SELECTED POPULATION DEMOGRAPHICS TOWN OF PEAK

# Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>	<u>1980</u>	Actual Change
Land Area (Square Miles)	.3		
Persons Per Square Mile	274		· ·
Total Population	74	81	-7
<5 years	4	0	+4
5-14 years	4	17	-13
15-59 years	32	39	-7
60-64 years	10	6	+4
65+ years	24	19	+5
Male	33	40	-7
<5 years	0	0	0
5-14 years	0	9	-9
15-59 years	15	18	-3
60-64 years	2	. 3	-1
65+ years	16	10	+6
Female	41	41	0
<5 years	4	0	+4
5-14 years	4	8	-4
15-59 years	17	21	-4
60-64 years	8	3	+5
65+ years	8	9	-1
White	61	43	+18
<5 years	4	0	+4
5-14 years	4	5	-1
15-59 years	29	13	+16
60-64 years	9	6	+3
65+ years	15	19	-4
Black	13	38	-25

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<5 years	0	0	0
5-14 years	0	12	-12
15-59 years	3	. 26	-23
60-64 years	1	0	+1
65+ years	9	0	+9
Other	0	0	0
<5 years	0	. 0	0
5-14 years	0	0	. 0
15-59 years	0	0	0
60-64 years	0	0	0
65+ years	. 0	. 0	0

Consistent with a declining population, the total number of households declined between 1990 and 1980. The only increases were in the number of married couples and married couples without children. It is not clear whether the decline in children is due to older couples with "empty nests" or younger couples not ready to have children. Despite the cause, without a younger generation growingup in the town, the only growth that can be expected is people migrating to the town. The 1980 figure for those 65 and older living alone was not available at the time of this writing. For the purpose of Table P-8, the category "Non-Family" is defined as 2 or more unrelated people living in the same household.

#### TABLE P-8

#### SELECTED HOUSEHOLD DEMOGRAPHICS

#### TOWN OF PEAK

#### Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>		<u>1980</u>	Actual Change
Total Households	34		38	-4 .
Family	24		21	+3
Married Couple	24		15	+9
W/Children	6	8		-2
W/O Children	18		7	+11
Single Headed	0		6	-6
W/Children	0	3		-3
W/O Children	0		3	-3
Males, No Wife	0		3	-3
W/Children	0	0	i.	0
W/O Children	0		3	-3
Female, No Husband	0		3	-3
W/ Children	0		3	-3
W/O Children	0		0	0
Non-family	10		17	-7
65+ Living Alone	10			

Revised August 4, 1998

<u>Population Projections</u>: While there are no population projections for the town, the population projections for census tract 9506.00 is expected to increase to 8,790 in the year 2015. However, the increase is likely to be on the western side of I-26, not where the town is located. If the town could maintain its current percentage of the census tract's population, then the town population would be 88 people in the year 2015. This would be an increase of 14 people. If the town limits were expanded to include adjacent developed and developing areas, this number could increase substantially.

#### 2. Needs and Goals

The steady decline in population is expected to continue, despite the projected increase in population in the census tract. The town's location away from the major growth area of the tract, coupled with an aging population are the major factors in the projected decline.

<u>Goal for the Town of Peak</u>: The primary population goal for the Town of Peak is to maintain the current population of the town at the level of at least 1% of census tract 9506.00.

#### C. Town of Pomaria

#### 1. Inventory

The 1990 population of Pomaria was 272, which was .8% of Newberry County's population, and 8.3% of the population of Census Tract 9501.00 where Pomaria is located. The area of the town is 1 square mile. As Table P-9 shows, the town's population increased by 12 people between 1980 and 1990. According to the statistics, most of the increase were males. A discussion of the race, age and gender categories follows.

- Race: Contrary to the trend in the county, the number of white people increased while the number of black people decreased. Also, in contrast to the county's population, there was no one classified as "other" in the town.
- Age: The only decline occurred in those under 5, which declined by 12. Of the 12, 8 were female and 4 were male.
- Gender: The number of males increased by 22 while the number of females decreased by 12. Additionally, the only age group to decrease among males was those under 5, while the only age group to increase among females was those between the ages of 15 and 59.

### TABLE P-9 SELECTED POPULATION DEMOGRAPHICS TOWN OF POMARIA

#### Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>	<u>1980</u>	Actual Change
Land Area (Square Miles)	1		· · ·
Persons per Square Mile	272		
Total Population	272	260	+12
<5 years	11	23	-12
5-14 years	45	38	+7
15-59 years	167	154	+13
60-64 years	14	12	+2
65+ years	35	33	+2
Male	130	108	+20
<5 years	7	11	-4
5-14 years	8	3	+5
15–59 years	32	81	-49
60-64 years	7	7	0
65+ years	8	20	-12
Female	142	152	-10
<5 years	4	12	-8
5-14 years	18	24	-6
15-59 years	94	83	+11
60-64 years	5	6	-1
65+ years	21	27	-6
White	129	115	+14
<5 years	3	4	-1
5-14 years	14	3	11

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15-59 years	76	81	-5
60-64 years	12	7	+5
65+ years	24	20	+4
Black	143	145	-2
<5 years	8	19	-11
5-14 years	31	35	-4
15-59 years	91	73	+18
60-64 years	2	5	-3
65+ years	11	13	-2
Other	0	· 0	0
<5 years	0	0	0
5-14 years	0	0	0
15-59 years	0	0	0
60-64 years	0	0	0
65+ vears	0	0	0

The increase in population is represented in Table P-10 which shows a decline in only two categories of families- Married Couple with children and Single Headed without children. The other significant trend was the decline of Married Couples with children, compared with the increase of single headed families with children. The 1980 figure for those 65 and older living alone was not available at the time of this writing. For the purpose of Table P-10, the category "Non-Family" is defined as 2 or more unrelated people living in the same household.

#### **TABLE P-10**

#### SELECTED HOUSEHOLD DEMOGRAPHICS TOWN OF POMARIA

# Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	1990	1980	Actual Change
Total Households	104	68	+36
Family	80	66	+14
Married Couple	53	47	+6
W/Children	15	21	-6
W/O Children	38	26	+12
Single Headed	27	19	+8
W/Children	18	7	+11
W/O Children	9	12	-3
Males, No Wife	6	0	+6
W/Children	4	0	+4
W/O Children	2	0	+2
Female, No Husband	21	19	+2
W/ Children	14	7	+7
W/O Children	7	12	-5

Non-family	24	2	+22
65+ Living Alone	15		

<u>Population Projections</u>: While there are no population projections for the town, the population for the census tract is expected to increase to 3,635 by 2015. If the town maintains the current percentage of the tract population, then the town's population would be 302 people by 2015. This would be an increase of 30 people. If the town limits were expanded to include adjacent developed and developing areas, this number could increase substantially.

#### 2. Needs and Goals

Population growth depends on the growth of job opportunities within commuting distance of present residents as well as attracting migrants to new job opportunities located inside and outside the town. Pomaria should take advantage of its location in relation to I-26 by expanding its municipal limits toward the interchange.

<u>Goals for Population Element</u>: The primary population goal for Pomaria is to maintain the current population of the town at the level of at least 8.3% of census tract 9501.00.

D. Town of Prosperity

1. Inventory

#### 1. Inventory

The 1990 population of Prosperity was 1,114, which was 3.4% of Newberry County's population, and 14.4% of the population of Census Tract 9506.00 where Prosperity is located. The area of the town is 1.9 square miles. As Table P-10 shows, the town's population increased by 304 people between 1980 and 1990. This increase was in every category except in the white population. A discussion of the age, race and gender categories follows.

Age: The most significant trend is the increase in those under the age of 5 by 43 people. This indicates that the population is stable and should remain that way for several years. The increase is most prominent in black males where those under 5 increased by 37.

Race: Consistent with the county's trend, the number of whites decreased while the number of blacks increased. More significant, however, is the increase of those classified as "other." In 1980, there was no one in this classification. By 1990, however, 7 people were in this classification.

Gender: Females out-numbered males by 106 people, and the number of females grew at a faster rate.

# TABLE P-10 SELECTED POPULATION DEMOGRAPHICS TOWN OF PROSPERITY

	<u>1990</u>	<u>1980</u>	Actual Change
Land Area (Square Miles)	1.9		
Persons per square mile	586		
Total Population	1,114	810	+304
<5 years	86	43	+43
5-14 years	168	148	+20
15-59 years	657	445	+212
60-64 years	34	38	-4
65+ years	169	136	+33
Male	504	371	+133
<5 years	42	12	+30
5-14 years	79	64	+15
15-59 years	298	227	+71
60-64 years	18	7	+11
65+ years	67	61	+6
Female	610	439	+171
<5 years	44	31	+13
5-14 years	89	84	+5
15-59 years	359	218	+141

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60-64 years	16	31	-15
65+ years	102	75	+27
White	544	562	-18
<5 years	27	24	+3
5-14 years	66	93	-27
15-59 years	310	326	-16
60-64 years	28	18	+10
65+ years	113	101	+12
Black	563	248	+315
<5 years	56	19	+37
5-14 years	100	55	+45
15-59 years	345	119	+226
60-64 years	6	20	-14
65+ years	56	35	+21
Other	7	0	+7
<5 years	3	0	+3
5-14 years	2	0	+2
15-59 years	2	0	+2
60-64 years	· 0	0	0
65+ years	0	0	. 0

The increase in population is also depicted in Table P-11. Only two categories of households decreased between 1980 and 1990- Married Couples with children and Males without children. The other significant trend was the rate of growth in single parent families which increased by 38. Most of this increase was in female headed families which grew by 33 families. The 1980 figure for those 65 and older living alone was not available at the time of this writing. For the purpose of Table P-11, the category "Non-Family" includes 2 or more unrelated people living in the same household.

#### TABLE P-11 SELECTED HOUSEHOLD DEMOGRAPHICS TOWN OF PROSPERITY

Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	· <u>1990</u>	<u>1980</u>	Actual Change
Total Households	414	299	+115
Family	295	236	+59
Married Couple	203	193	+10
W/Children	81	108	-27
W/O Children	122	85	+37
Single Headed	92	43	+49
W/Children	53	15	+38
W/O Children	39	28	+11
Males, No Wife	16	16	0

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W/Children	5	0	+5
W/O Children	11	16	-5
Female, No Husband	76	27	+49
W/ Children	48	15	+33
W/O Children	28	12	+16
Non-family	119	63	+56
65+ Living Alone	50		

<u>Population Projections</u>: While there are no population projections for the town, census tract 9506.00 is expected to increase to 8,790 people by 2015. If the town's percentage of the tract's population stays consistent, the population of the town should be 1,266 by 2015. This would be an increase of 152 people. The proximity to the City of Newberry, Lake Murray and I-26 should be factors in the increase in population. If the town limits were expanded to include adjacent developed and developing areas, this number could increase substantially.

#### 2. Needs and Goals

Prosperity is seeing some of the same population changes that the county is seeing. As was mentioned, several factors influence the growth of Prosperity. The town should take advantage of these factors and be aggressive by expanding its municipal limits toward I-26 to capitalize on future development along the interstate.

As the demographics of the population change, the town must be prepared to meet the needs of the changing population. This will be most significant to single parent families, those over the age of 65, and those classified as "other."

<u>Goal for Population Element</u>: The primary population goal for the Town of Prosperity is to maintain the population of the town at a level of at least 14% of census tract 9506.00.

#### E. Town of Silverstreet

#### 1. Inventory

The population of Silverstreet is 165, which is .5% of Newberry County's population, and 1.75% of the population of Census Tract 9505.00 where Silverstreet is located. The area of the town is 3.5 square miles. As Table P-12 shows, the town's population declined by 29 people between 1980 and 1990; 19 were male and 10 were female. A discussion of the age, race and gender categories follows.

Age: Every age group decreased except those over 65 which increased by 36. This trend is found in the overall population as well as every race and gender category except among the black population, where every age group decreased.

Contrary to the trend in the county, there was a decline in both the black and white categories, however, there were 138 white people and only 27 black people in the town. There was no one classified as "other."

Gender: There were 5 more males than females in 1990. However, the number of males declined by 19, while the number of females declined by only 10.

#### TABLE P-12 SELECTED POPULATION DEMOGRAPHICS TOWN OF SILVERSTREET

Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>	<u>1980</u>	Actual Change
Land Area (Square Miles)	3.5		
Persons per Square Mile	47		• • •
Total	165	194	-29
<5 years	6	9	-3
5-14 years	20	24	-4
15-59 years	68	105	-37
60-64 years	0	21	-21
65+ years	71	35	+36
Male	85	104	-19
<5 years	2	3	-1
5-14 years	13	16	-3
15-59 years	39	63	-24

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Race:

60-64 years	0	7	-7
65+ years	31	15	+16
Female	80	90	-10
<5 years	4	6	-2
5-14 years	7	8	-1
15-59 years	29	42	-13
60-64 years	0	14	-14
65+ years	40	. 20	+20
White	138	153	-15
<5 years	4	6	-2
5-14 years	13	14	-1
15-59 years	57	87	-30
60-64 years	0	19	-19
65+ years	64	27	+37
Black	27	41	-14
<5 years	2	3	-1
5-14 years	7	10	-3
15-59 years	11	18	-7
60-64 years	0	2	-2
65+ years	7	8	-1
Other	0	0	0
<5 years	0	0	0
5-14 years	0	0	0
15-59 years	0	0	0
60-64 years	0	0	0
65+ years	0	0	0

The decline in population is illustrated even further in Table P-12. The number of households decreased by only 3, but this is offset by an increase in non-families by 8. The number of families actually decreased by 11. The only increase in families was in the number of married couples with children, which only increased by 3. The 1980 figure for those 65 and older living alone was not available at the time of this writing. For the purpose of Table P-12, the category "Non-Family" is defined as 2 or more unrelated people living in the same household.

#### TABLE P-12 SELECTED HOUSEHOLD DEMOGRAPHICS TOWN OF SILVERSTREET

Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>	<u>1980</u>	Actual Change
Total Households	70	73	-3
Family	46	57	-11
Married Couple	45	46	-1

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W/Children	15	12	+3
W/O Children	30	34	· -4
Single Headed	1	11	-10
W/Children	1 .	2	-1
W/O Children	0	9	-9
Males, No Wife	0	5	-5
W/Children	0	0	0
W/O Children	0	5	-5
Female, No Husband	1	6	-5
W/ Children	1	2	-1
W/O Children	0	4	-4
Non-family	24	16	+8
65+ Living Alone	15		

<u>Population Projections</u>: While there is no population projection for the town, the population of census tract 9505.00 is expected to be 10,030. If the town could maintain its current percentage of the census tract's population, the projected population for 2015 would be 176 people. This would be an increase of 11 people. If the town limits were expanded to include adjacent developed and developing areas, this number could increase substantially.

#### 2. Needs and Goals

Silverstreet's declining population in contrast to the rising population of the county indicates that opportunities are being sought outside of town. In addition to the decline in population, the town is experiencing an increase in those over the age of 65, while those under 14 are decreasing. This indicates that if current trends persist, the population will continue to decline. The town must try to encourage economic development to attract new residents. The other opportunity is to develop a "bedroom" community for those taking advantage of the economic growth in the region. The town must be aware of the changing characteristics of the population.

<u>Goals for Population Element</u>: The primary population goal for the Town of Silverstreet is to maintain the population of the town at a level of at least 1.75% of the population of census tract 9505.00.

#### F. Town of Whitmire

#### 1. Inventory

The 1990 population of Whitmire was 1,702, which was 5.1% of Newberry County's population, and 51.9% of the population of Census Tract 9503.00 where Whitmire is located. The area of the town is 1.1 square miles. As Table P-12 shows, the town's population declined by 336 people between 1980 and 1990. The decline is consistent across all categories, except for those over the age of 65. A discussion of the age, race and gender categories follows.
- Age: In the overall population, every age group declined significantly except for those over the age 65 which increase by 39 people. This trend was reflected found among females, where those 65 and over increased by 22. In males, those 60 and over increased by 21 people.
- **Race:** While there was a significant decline in both the white and black populations, there were 1,427 white people and only 272 black people in 1990.

Gender: The number of females declined by 172 while the number of males declined by 164.

## TABLE P-12 SELECTED POPULATION DEMOGRAPHICS TOWN OF WHITMIRE

Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>	<u>1980</u>	Actual Change
Land Area (Square Miles)	1.1		•
Persons Per Square Mile	1,547		
Total Population	1,702	2,038	-336
<5 years	85	113	-28
5-14 years	192	243	-51
15-59 years	897	1,179	-282
60-64 years	129	143	-14
65+ years	399	360	+39

Male	801	965	-164
<5 years	46	64	-18
5-14 years	100	126	-26
15-59 years	448	589	-141
60-64 years	60	56	+4
65+ years	147	130	+17
Female	901	1,073	-172
<5 years	39	49	-10
5-14 years	92	117	-25
15-59 years	449	590	-141
60-64 years	69	87	-18
65+ years	252	230	+22
White	1,427	1,713	-286
<5 years	69	94	-25
5-14 years	157	198	-41
15-59 years	739	994	-255
60-64 years	110	123	-13
65+ years	352	304	+48
Black	272	321	-49
<5 years	16	15	-1
5-14 years	35	45	-10
15-59 years	155	185	-30
60-64 years	19	20	-1
65+ years	47	56	-9
Other	3	4	-1
<5 years	0	0	0
5-14 years	0	4	-4
15-59 years	3	0、	+3
60-64 years	0	0	0
65+ years	0	0	0

While the total number of households decreased by only 38, the number of families decreased by 107. The other significant trend was the increase in single parent households, particularly Male Headed families with children which increased by 12. In contrast, Married Couples with children decreased by 66. The 1980 figure for those 65 and older living alone was not available at the time of this writing. For the purpose of Table P-13, the category "Non-Family" is defined as 2 or more unrelated people living in the same household.

## TABLE P-13 SELECTED HOUSEHOLD DEMOGRAPHICS TOWN OF WHITMIRE

Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>	<u>1980</u>	Actual Change
Total Households	769	807	-38
Family	499	606	-107
Married Couple	373	496	-123
W/Children	123	189	-66
W/O Children	250	307	-57
Single Headed	126	110	+16
W/Children	59	32	+27
W/O Children	67	78	-11
Males, No Wife	36	22	+14
W/Children	16	4	+12
W/O Children	20	18	+2
Female, No Husband	l 90	88	+2
W/ Children	43	28	+15
W/O Children	47	60	-13
Non-family	270	201	+69
65+ Living Alone	150		

<u>Population Projections</u>: While there are no population projections for the town, census tract 9503.00 is projected to increase to 4,150 by the year 2015. If the town could maintain its current percentage of the tract's population, the population of the town would be 2,131. This would be an increase of 429 people. If the town limits were expanded to include adjacent developed and developing areas, this number could increase substantially.

#### 2. Needs and Goals

The one way to attract residents to the town is by providing an attractive place to live which is in easy commuting distance to job opportunities. Since Whitmire is located in the middle of Sumter National Forest, the opportunities to encourage new development is going to be limited. The decrease in every age group except those over 65 indicates that the decline in population will continue. The town should evaluate its services to insure that they meet the needs of the changing demographics, especially for single parent families and those over the age of 65.

<u>Goal for Population Element</u>: The population goal for the Town of Whitmire is to maintain the population of the town at a level of at least 52% of the population of census tract 9503.00.

#### G. Town of Little Mountain

#### 1. Inventory

The 1990 population of Little Mountain was 241, which was .7% of Newberry County's population, and 3% of the population of Census Tract 9506.00 where Little Mountain is located. The area of the town is 1.1 square miles. As Table P-14 shows, the town's population declined by 57

people between 1980 and 1990. A discussion of the age, race and gender categories follows.

Age: In the overall population, every age group declined except for those over the age of 65 which increased by 5. The increase in those over 65 is found primarily in the white population and in females.

Race: Both the white and black populations declined, but the white population only decreased by 7, while the black population decreased by 50. The town population did not have anyone classified as "other."

Gender: In 1980, females outnumbered males by 2. By 1990, females outnumbered males by 7.

## TABLE P-14 SELECTED POPULATION DEMOGRAPHICS TOWN OF LITTLE MOUNTAIN

Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>	<u>1980</u>	Actual Change	
Land Area (Square Miles)	1.1			
Persons per Square Mile	219			

Total Population	241	298	-57
<5 years	8	17	-9
5-14 years	40	48	-8
15-59 years	146	186	-40
60-64 years	4	9	-5
65+ years	43	38	5
Male	117	148	-31
<5 years	3	5	-2
5-14 years	22	32	-10
15-59 years	79	94	-5
60-64 years	2	5	-3
65+ years	11	12	-1
Female	124	150	-26
<5 years	5	12	-7
5-14 years	18	16	2
15-59 years	67	92	-25
60-64 years	2	4	-2
65+ years	32	26	6
White	215	222	-7
<5 years	7	17	-10
5-14 years	37	35	2
15-59 years	129	139	-10
60-64 years	4	5	-1
65+ years	38	26	12
Black	26	76	-50
<5 years	1	0	1
5-14 years	3	13	-10
15-59 years	17	47	-30
60-64 years	0	4	-4
65+ years	5	12	-7
Other	0	0	0
<5 years	0	0	0
5-14 years	0	0	0
15-59 years	0	0	0
60-64 years	0	0	0
65+ years	0	0	0

While the number of households only decreased by 8, the number of families decreased by 16. Most significant was the decline of families with children. The only increases in families were found in married couples without children, which increased by 1, and males without children, which increased by 2. The 1980 figure for those 65 and older living alone was not available at the time of this writing. For the purpose of Table P-15, the category "Non-Family" is defined as 2 or more unrelated people living in the same household.

Revised August 4, 1998

#### TABLE P-15 SELECTED HOUSEHOLD DEMOGRAPHICS TOWN OF LITTLE MOUNTAIN Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

1990 <u>1980</u> Actual Change **Total Households** 95 103 -8 Family 68 84 -16 -7 **Married** Couple 57 64 W/Children 23 31 -8 W/O Children 34 33 1 Single Headed 11 20 -9 W/Children 3 10 -7 W/O Children 8 10 -2 Males, No Wife 2 0 2 W/Children 0 0 0 W/O Children 2 0 2 9 Female, No Husband 20 -11 W/ Children 3 10 -7 W/O Children 6 10 -4 27 Non-family 19 8 65+ Living Alone 16

<u>Population Projections</u>: While there is no population projection for the town, census tract 9506.00 is expected to increase to 8,790 by the year 2015. If the town could maintain the current percentage of the census tract population, the town's population would be 264 by 2015. This would be an increase of 23 people. If the town limits were expanded to include adjacent developed and developing areas, this number could increase substantially.

#### 2. Needs and Goals

Despite the decline of the town's population, Little Mountain has an opportunity for future growth. I-26 will be the catalyst for the growth in two ways: by providing easy access to job opportunities, allowing Little Mountain to be a "bedroom" community, and by providing attractive land for future development near the SC 202 interchange.

The town should evaluate its services to make sure that the needs of those over the age of 65 are being met, since this age group is one segment of the population that is growing.

<u>Goal for Population Element</u>: The population goal for the Town of Little Mountain is to maintain the population of the town at a level at least 3% of the population of census tract 9506.00.

H. City of Newberry

#### 1. Inventory:

The 1990 population of the City of Newberry was 10,539, which was 31.7% of Newberry County's population, and 60.9% of the population of Census Tracts 9502.00 and 9505.00 which split the City of Newberry. The area of the town was 6.2 square miles. As Table P-16 shows, the town's population increased by 673 people between 1980 and 1990. A discussion of the age, race and gender categories follows.

Age:

In the overall population, every age group increased except for those between the ages of 60 and 64 which decreased by 31. Those 14 and under increased by 478 people.

Race: The white population decreased by 537 people while the black population increased by 1,193 people. There were 44 people classified as "other," which was an increase of 17.

Gender: In 1990, females outnumbered males by 977 people. In 1980 however, females outnumbered males by only 654 people. Another significant trend is that every age group among females increased, while the male population decreased in those 15 and over.

## TABLE P-16 SELECTED POPULATION DEMOGRAPHICS CITY OF NEWBERRY Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	1990	1980	Actual Change
Land Area (Square Miles)	6.2	•	
Persons Per Square Mile	1,700		
Total Population	10,539	9,866	+673
<5 years	797	554	+243
5-14 years	1,477	1,242	+235
15-59 years	5872	5,784	+88
60-64 years	504	535	-31
65+	1,889	1,751	+138
Male	4,781	4,606	+175
< 5 years	412	291	+121
5-14 years	771	608	+163
15-59 years	2,789	2,825	-36
60-64 years	194	226	-32
65+ years	615	656	-41
Female	5,758	5,260	+498
< 5 years	385	263	+122
5-14 years	706	634	+72
15-59 years	3,083	2,959	+124
60-64 years	310	309	+1
65+ years	1,274	1,095	+179
White	6,095	6,632	-537
< 5 years	268	310	-42
5-14 years	675	660	+15
15–59 years	3,332	3,938	-606
60-64 years	375	406	-31
65+ years	1,445	1,318	+127
Black	4,400	3,207	+1193
< 5 years	529	244	+285
5-14 years	794	582	+212
15-59 years	2,518	1,834	+684
60-64 years	115	129	-14
65+ years	444	418	+26
Other	44	27	+17
< 5 years	-0-	0	0
5-14 years	8	0	+8
15-59 years	22	12	+10
60-64 years	14	0	+14
65+ years	0	15	-15

Consistent with the increase in population, the number of households increased by 191. Significant with this increase however, was that the number of Single Headed families with children increased by 234 while the number of Married Couples with children increased by only 8. The total

number of Single Headed families increased by 303 while the total number of Married Couples decreased by 134. The 1980 figure for those 65 and older living alone was not available at the time of this writing. For the purpose of Table P-4, the category "Non-Family" is defined as 2 or more unrelated people living in the same household.

#### TABLE P-17

#### SELECTED HOUSEHOLD DEMOGRAPHICS CITY OF NEWBERRY

#### Source: U.S. Department of Commerce, Bureau of the Census STF3A Tape File

	<u>1990</u>	<u>1980</u>	Actual Change
Total Households	3,968	3,777	+191
Family	2,726	2,557	+169
Married Couple	1,771	1,905	-134
W/Children	729	721	+8
W/O Children	1,042	1,184	-142
Single Headed	955	652	+303
W/Children	578	344	+234
W/O Children	377	308	+69
Males, No Wife	166	114	+52
W/Children	84	41	+43
W/O Children	82	73	+9
Female, No Husban	nd 789	538	+251
W/ Children	494	303	+191
W/O Children	295	235	+60
Non-family	1,242	1,220	+22
65+ Living Alone	709		

<u>Population Projections</u>: While there is no population projection for the town, census tract 9502.00 and 9505.00 are expected to increase to 18,790 by the year 2015. If the city could maintain the current percentage of the census tract populations, the city's population would be 11,443 by 2015. This would be an increase of 904 people. If the city limits were expanded to include adjacent developed and developing areas, this number could increase substantially.

#### 2. Needs and Goals

The fact that the City of Newberry is the County Seat, is a full service city, is at the center of the county, and is near three interchanges to I-26, influenced the growth of the city in the 1980's. The two factors that will increase in importance for the city's growth are the extension of water and sewer, and the development of land near the three interchanges to I-26.

<u>Goal for Population Element</u>: The population goal for the City of Newberry is to maintain the population of the town at a level at least 60% of the population of census tracts 9502 and 9505

## POPULATION MAP

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#### CHAPTER II ECONOMIC ELEMENT

#### A. Newberry County

Newberry County is located in the midlands of South Carolina between Columbia and the Greenville/Spartanburg area. The City of Newberry, which is located near the center of the county, is 40 miles from Columbia, 65 miles from Greenville and 55 miles from Spartanburg. The I-26 Corridor running through Newberry County is the life-line of economic development in the county, not only due to the traffic passing through the county, but also by providing access to markets outside of the county. I-26 intersects with I-20 and I-77 in Columbia, with I-85 in Greenville/Spartanburg, and with I-40 in Asheville 122 miles from the City of Newberry. Additionally, I-26 provides direct access to Charleston and its seaport, which is 149 miles from the City of Newberry.

#### 1. Inventory

Table E-1 provides information on the education levels attained by the residents of Newberry County. During the 1980's there was a substantial improvement in the education level of the population aged 25 and older. By 1990, 11,531 residents 25 and over had some high school education. Even though the number of persons with no high school education decreased, there were still 8,059 adults without a high school diploma. The employability of these people is lower than those with additional education.

While there was an encouraging 44% increase in the adults with at least some college, it should be noted that while the number of adults with some high school education but no diploma decreased by 149 people in the total population. The same category increased by 815 people in the black population. This is a good indication that school dropouts may be a concern in the black population, which could impact the employability of this younger population.

The economy of the 21st century will require a work force that can read, write, communicate and use a computer. A workforce with these basic skills can be trained and retrained to fill the everchanging job needs of the future.

Revised August 10, 1998

## **TABLE E-1**

## SELECTED EDUCATION INFORMATION PERSONS 25 AND OVER NEWBERRY COUNTY Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total			
<9th Grade	3,649	5,651	-2,002
High School	11,531	8,943	+2,588
No Diploma	4,410	4,559	-149
Graduate	7,121	4,384	+2,737
College	6,095	4,240	+1,855
1-3 Years	3,446	1,975	+1,471
4+ Years	2,649	2,265	+384
White			
<9th Grade	2,012	3,279	-1,267
High School	7,635	6,691	+944
No Diploma	2,350	3,316	-966
Graduate	5,285	3,375	+1,910
College	5,165	3,766	+1,399
1-3 Years	2,746	1,796	+950
4+ Years	2,389	1,970	+419
Black			
<9th Grade	1,579	2,350	-771
High School	3,860	2,242	+1,618
No Diploma	2,058	1,243	+815
Graduate	1,802	999	+803
College	959	474	+485
1-3 Years	700	179	+521
4+ Years	259	295	-36
Other			
<9 <sup>th</sup> Grade	58	22	+35
High School	36	10	+26
No Diploma	0	2	-2
Graduate	34	10	+24
College	1	0	+1
1-3 Years	0	0	0

4+ Years

0

0

Table E-2 shows the employment in Newberry County by job sectors in 1980 and 1990.

## TABLE E-2

## INDUSTRY OF EMPLOYED PERSON 16 YRS AND OLDER NEWBERRY COUNTY Source: U.S. Department of Commerce, Bureau of the Census

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			<u>Change</u>			
Sector	<u>1990</u>	<u>1980</u>	<u> *80-*90</u>	<u>1970</u>	<u>1960</u>	<u>1950</u>
Agriculture, Forestry & Fisheries	567	616	-49	831	1,156	2,808
Mining	22	13	9	52	20	31
Manufacturing	5,089	5,485	-396	5,479	4,377	4,374
Construction	985	1,032	-47	777	651	602
Transportation	494	320	+174	210	159	182
Communication and						
other Public Utilities	526	502	+24	329	160	191
Wholesale/Retail Trade	2,676	2,259	+417	1,677	1,693	1,470
Financial/Insurance/Real Estate	510	437	+73187	276	172	
Business and Repair Services	439	259	+180	100	86	184
Personal/Entertainment		•				
and Rec. Services	477	392	+85	416	287	327
Professional and Related Services	2,704	2,377	+327	1,561	948	672
Public Administration	611	560	+51	279	239	231

As shown in Table E-2, the number of people living in Newberry County who are employed showed a net increase of 848. Eight of the eleven job sectors showed an increase in employment. Of the three categories that declined, manufacturing showed the biggest decrease by losing 396 jobs. The category with the biggest increase was in the wholesale/retail trade which gained 418 jobs. Since 1950, the agriculture, forestry and fishing sector has decreased by 2,241 jobs. However, during the same period, manufacturing jobs increased by 715 jobs and wholesale/retail trade increased by 1,206.

Table E-3 shows the non-wage and salary employment by industry from 1987 to 1996. These numbers show the jobs available in the county.

## TABLE E-3 NON-WAGE AND SALARY EMPLOYMENT BY INDUSTRY

## NEWBERRY COUNTY

#### Source: SC Employment Security Commission Labor Market Information Division

	<u>1996</u>	<u>1995</u>	<u>1994</u>	<u>1993</u>	<u>1992</u>	<u>1991</u>	1990	1989	<u>1988</u>	<u>1987</u>
Total Emp.	13,450	12,900	12,500	12,090	11,770	11,770	11,650	11,640	11,710	11,390
Manufacturing	5,820	5,550	5,280	5,030	4,910	5,040	4,900	5,060	5,330	5,130
Const. & Mining	590	590	640	620	580	590	550	560	520	530
Transportation &										
Pub. Utl.	340	370	360	420	460	430	410	390	380	430
Trade	. 2140	2,190	2,230	2,090	2,110	2,220	2,280	2,200	2,140	2,080
<b>Financial Institutions</b>			•		· .					•
& Real Estate	220	240	250	240	240	260	310	310	300	290
Services (1)	2,230	1,900	1,720	1,610	1,520	1,330	1,320	1,280	1,280	1,190
Government	2,110	2,070	2,030	2,080	1,960	1,900	1,880	1,850	1,750	1,740

(1)= Included in services are Mining and Agricultural Services.

Of the eight categories, only two have shown a decrease in employment: transportation and public utilities, and financial institutions and real estate. Of the six categories that have increased, the biggest increase was in services which gained 1,040 jobs.

Table E-4 shows the earnings by industry in Newberry County from 1970 to 1995.

## TABLE E-4 EARNINGS BY INDUSTRY NEWBERRY COUNTY (in thousands of dollars)

#### Source: Regional Economic Information, bureau of Economic Analysis

<u>Industry</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>
Farm	\$5,895	\$8,316	\$3,394	\$10,113	\$12,119	\$4,653
Agric. Services						
Forestry, Fishing	214	463	937	1,600	2,642	2,685
Mining	(L)	73	244	125	(L)	76
Construction	3,240	4,064	8,967	9,880	16,506	21,711
Manufacturing	26,374	40,509	79,083	94,078	100,862	143,504
Non-durable Goods	22,973	25,691	49,204	52,671	68,148	86,308
Transportation &						
Public Utilities	1,915	2,528	6,225	10,563	10,744	13,458
Wholesale Trade	1,112	1,825	6,048	4,001	6,521	11,271
Retail Trade	6,932	9,768	16,409	22,901	26,492	30,434
Finance, Insurance						
& Real Estate	1,115	1,635	2,654	3,801	5,832	6,885
Services	7,333	9,328	15,702	21,402	28,717	45,555
Gov. & Gov.				•		
Enterprises	6,715	10,946	17,746	27,251	39,009	49,820

L= Less than \$50,000.

During the time period, the only industry that declined in earnings was farming. The farming industry has fluctuated, from a low of \$3,394,000 in 1980 to a high of \$10,113,000 in 1985. The earnings in 1995 was only \$4,653,000. Mining is the only other industry that has not shown a steady increase since 1970. The biggest gain has been in the manufacturing industry, which has increased from \$26,374,000 in 1970 to \$143,504,000 in 1995. Clearly, the efforts of the county to attract industrial investment into the county has been effective.

The economic impact of the natural resources such as Lake Murray, Lake Greenwood, the Revised August 10, 1998

Sumter National Forest, and the associated agricultural and recreational activities will be discussed further in the Natural Resources element of the Comprehensive Plan.

Tables E-5a, b, and c show selected agricultural statistics for Newberry County.

## TABLE E-5a 1994 NEWBERRY COUNTY AGRICULTURAL STATISTICS Source: South Carolina Agricultural Statistics Service

1994 Crops	Acres Harvested	Yield	Production	State Rank
Barley for Grain, Bu.	1,350	79	107,00	2
Corn for Grain, Bu.	2,300	101	232,300	25
Cotton, Lb. & Bales	-	-	-	-
Hay, All, Ton	10,900	2.8	30,100	6
Oats for Grain, Bu.	2,000	69	138,000	5
Peanuts, Lbs.	-	-	_	-
Rye, Bu.	-	-	-	-
Sorghum, Bu.	1,450	47	68,100	1
Soybeans, Bu.	3,850	36	138,600	23
Tobacco, Lbs.	-	-	-	-
Winter Wheat, Bu.	7,800	51	398,700	15
Apples, Lbs.	-	-	-	
Peaches, Lbs.		-	-	-

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# TABLE E-5b 1995 NEWBERRY COUNTY AGRICULTURAL STATISTICS Source: South Carolina Agricultural Statistics Service

1995 Crops	Acres Harvested	Yield	Production	State -> Rank
Barley for Grain, Bu.	1,650	46	75,900	1
Com for Grain, Bu.	2,200	86	189,200	24
Cotton, Lb. & Bales	•	-	-	-
Hay, All, Ton	17,300	2	34,600	5
Oats for Grain, Bu.	1,750	43	75,300	4
Peanuts, Lbs.		-	-	-
Rye, Bu.	300	26	7,800	16
Sorghum, Bu.	1,400	46	64,300	2
Soybeans, Bu.	4,500	28	124,600	23
Tobacco, Lbs.	-	-	-	-
Winter Wheat, Bu.	5,700	33	185,700	17
Apples, Lbs.	-	-	-	-
Peaches, Lbs.	-	-	-	-

1996 Crops	Acres Harvested	Yield	Production	State
Barley for Grain, Bu.	1,200	52	62,900	kank 1
Corn for Grain, Bu.	2,800	71	199,900	25
Cotton, Lb. & Bales	440	545	500	32
Hay, All, Ton	14,800	1.9	28,400	3 .
Oats for Grain, Bu.	1,250	45	56,300	10
Peanuts, Lbs.	-	-	-	-
Rye, Bu.	300	34	10,300	16
Sorghum, Bu.	850	55	47,000	2
Soybeans, Bu.	4,150	26	109,500	23
Tobacco, Lbs.	-	-	-	-
Winter Wheat, Bu.	4,800	37	175,500	17
Apples, Lbs.	-	-	-	-

## TABLE E-5c 1996 NEWBERRY COUNTY AGRICULTURAL STATISTICS Source: South Carolina Agricultural Statistics Service

Peaches, Lbs.	_	-	_	

Over the three year period that statistics are available, the county consistently ranked high among the 46 counties in the production of barley, oats and sorghum.

Table E-6 provides detail on the economic impact of the county.

#### **TABLE E-6**

## AGRICULTURAL CASH RECIEPTS FOR NEWBERRY COUNTY Source: South Carolina Agricultural Statistics Service

Year	Crops	State: Rank	Livestock	State +	Total	State Rank
1994	\$4,778,000	36	\$36,852,000	4	\$41,630,000	15
1995	\$5,057,000	35	\$34,433,000	5	\$39,490,000	15
1996	\$5,017,000	32	\$38,380,000	8	\$43,397,000	17

During the three years shown in Table E-6, 1996 was the best year for crop production, and the worst year in livestock production. However, with cash receipts of \$38,380,000 in 1996, the greatest agricultural output for Newberry County is livestock.

Table E-7 shows the tax base for school purposes for Newberry County. This tax base was chosen to reflect the industrial contribution to the tax base. The figures are based on the assessed value of property.

#### TABLE E-7

## TAX BASE FOR SCHOOL PURPOSES FOR NEWBERRY COUNTY

Source: Newberry County Auditor

Year	Tax Base
1997	\$78,693,720
1996	\$75,712,070
1995	\$71,735,710
1994	\$67,504,420
1993	\$64,618,060
1992	\$65,081,840
1991	\$62,295,440
1990	\$59,097,030 (Reassessment)
1989	\$51,292,060
1988	\$49,697,030
1987	\$49,451,470
1986	\$47,706,090

1985	\$42,867,380
1984	\$40,149,350
1983	\$38,022,130
1982	\$37,609,930 (Reassessment)
1981	\$24,975,930
1980	\$24,078,380

Over the 18 year period provided, the tax base in the county has tripled. As the table indicates, the biggest increases in the tax base occurred during years of reassessment.

Table E-8 shows the gross sales and net taxable sales in Newberry County.

#### TABLE E-8

#### GROSS AND NET TAXABLE SALES IN NEWBERRY COUNTY Source: South Carolina Department of Revenue

YEAR	GROSS SALES	NET TAXABLE SALES
1997	\$522,279,971.45	\$206,394,713.33
1996	\$486,594,661.70	\$194,436,396.11
1995	\$507,363,729.47	\$192,228,726.29
1994	\$539,435,848.76	\$185,970,812.78
1993	\$491,418,621.33	\$173,856,446.58
1992	\$427,078,074.82	\$164,692,102.48
1991	\$494,128,389.21	\$164,880,387.31
1990	\$444,246,663.87	\$179,868,440.02
1989	\$400,978,756.49	\$152,698,033.53
1988	\$356,384,781.97	\$151,169,714.69
1987	\$335,199,562.61	\$141,185,252.13

During the eleven year period, gross taxable sales increased by 56%, while net taxable sales increased by 46%.

Table E-9 shows the labor force and unemployment in Newberry County since 1987.

#### TABLE E-9

#### LABOR FORCE AND UNEMPLOYMENT NEWBERRY COUNTY

Source: <u>South Carolina's Employment Trends</u>, South Carolina Employment Security Commission

	<u>Civilian</u>			Unemployment
	Labor Force	Employment	Unemployment	Rate
1996	18,410	17,260	1,150	6.2%
1995	18,130	17,110	1,020	5.6%
1994	17,480	16,460	1,020	5.8%
1993	17,560	16,200	1,360	7.7%
1992	17,480	16,190	1,290	7.4%
1991	16,950	16,050	900	5.3%
1990	16,510	15,600	910	5.5%
1989	15,030	14,160	870	5.8%
1988	15,100	14,290	810	5.4%
1987	14,980	14,050	930	6.2%
1986	14,830	13,870	960	6.5%
1985	14,550	13,610	940	6.5%

Since 1987, the civilian labor force has increased by 3,430 people while those unemployed has increased by 220 people. As a result, the unemployment rate in 1996 was the same as 1987- 6.2%. During the 10 year period, the unemployment rate was as low as 5.3% in 1990, to as high as 7.7% in 1993, with an average rate of 6.1%. There were two years of significant changes in the unemployment figure: between 1991 and 1992, those unemployed increased by 440 people; conversely, between 1993 and 1994 those unemployed decreased by 340 people.

The civilian labor force includes only those people who are employed or actively looking for work. If someone is unemployed but not looking for work, they are not included in the labor force. Thus, when jobs are scarce, the labor force will tend to decrease, and when jobs become available some of the unemployed may enter the work force to take the available jobs.

A comparison of the figures in Table E-9 and Table E-3 indicates that in 1996 some 17,260 residents of Newberry County were employed but there were only 13,450 jobs in the county. When it is recognized that many of these 13,450 jobs are filled by people commuting in to Newberry County from other counties, there are probably in excess of 5,000 residents commuting to jobs outside the county each work day.

Table E-10 shows the Newberry County labor force statistics for 1980 and 1990. Revised August 10, 1998

## TABLE E-10

## LABOR FORCE STATUS AND UNEMPLOYMENT RATE BY RACE & SEX FOR PERSONS 16 YRS AND OVER NEWBERRY COUNTY

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

		<u>1990</u>	<u>1980</u>	Actual Change
Total Population			•	
In Labor Force		16,188	14,934	+1,254
Armed Forces	52		50 +2	· · · ·
Civilian		16,136	14,884	+1,252
Employed		15,100	14,252	+848
Unemployed		1,036	632	+404
Not in Labor Force		9,565	8,905	+660
Unemployment Rate		6.4%	4.2%	•
Unemployed Not in Labor Force Unemployment Rate		1,036 9,565 6.4%	632 8,905 4.2%	+848 +404 +660

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In Labor Force		10,797	10,604	+193
Armed Forces	42		50 -8	<b>3</b> .
Civilian		10,755	10,554	+201
Employed		10,365	10,238	3 +127
Unemployed		390	31(	5 +74
Not in Labor Force		6,634	6,283	+351
Unemployment Rate		3.6%	3.0%	6
Black				
In Labor Force		5,345	4,30	7 +1,038
Armed Forces	10		0 +1	O
Civilian		5,335	4,30	7 +1,028
Employed		4,689	3,99	7 +692
Unemployed		646	31	0 +336
Not in Labor Force		2,882	2,59	9 +283
Unemployment Rate		12.1%	7:29	6
Other				·. ·
In Labor Force		46	2	3 +23
Armed Forces	0		0	0
Civilian		46	2	3 +23
Employed		46	1	7 +29
Unemployed		0		6 -6
Not in Labor Force		49	2	3 +26
<b>Unemployment Rate</b>		0	26.19	6

The increase in the labor force reflects the general increase in population in the county. In the total population, every category, except those in the anned forces, increased by sizable numbers. However, all of these increases are mostly found in the black population. Also significant was the number of unemployed in the black population, which increased by 336 people. In comparison, the number of unemployed in the white population only increased by 74. As of this writing, the unemployment statistics for 1997 were not available.

Table E-11 shows the place of work by residents of Newberry County for 1980 and 1990 as reported in the census.

#### TABLE E-11

## PLACE OF WORK BY RESIDENCE FOR WORKERS 16 YRS. AND OVER

#### NEWBERRY COUNTY

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Worked:	14,880	12,785	+2,095
Inside State	14,795	12,703	+2,092
In County	10,751	9,548	+1,203
Outside County	4,044	3,155	+889
Outside State	85	82	+3

The data above indicates that the county benefits from its geographic location. 4,044 of the workers age 16 and over worked outside of the county. Further discussion for each municipality may give a clearer picture as to where the people are going. Tables E-12 and E-13 give a detail description of the commuting into and out of Newberry County for 1980 and 1990. In 1990, 2,146 people were commuting into Newberry County while 4,129 were commuting out of Newberry County. Even though the number of people working outside of the county in Tables E-11, 12 and 13 do not match, it is still interesting to note that in 1990, 387 residents of Saluda County were commuting to Newberry County. This was the largest number of any of the counties listed. Conversely, 1,339 residents of Newberry County were commuting to Richland County.

#### TABLE E-12

## 1990 WORKER COMMUTING PATTERNS NEWBERRY COUNTY

Source: SC Employment Security Commission Labor Market Information Division Based on 1990 Census Data

In-Commuting From		<b>Out-Commuting To</b>		
County	Number	County	Number	
Abbeville	13	Abbeville	16	
Anderson	10	Aiken	39	
Beaufort	121	Anderson	23	
Chester	9	Calhoun	9	
Colleton	. 11	Charleston	41	
Darlington	7	Chester	33	
Revised Ano	st 10 1998			

Dillon	10	Clarendon	2
Dorchester	11	Darlington	2
Edgefield	23	Edgefield	16
Farifield	285	Fairfield	390
Florence	7	Florence	19
Greenville	28	Greenville	54
Greenwood	46	Greenwood	117
Laurens	198	Нопу	9
Lexington	383	Kershaw	2
Marion	12	Lancaster	16
Oconee	5	Laurens	813
Richland	172	Lexington	710
Saluda	387	Oconee	2
Spartanburg	10	Pickens	.8
Union	289	Richland	1,339
York	23	Saluda	38
Franklin, GA	3	Spartanburg	54
Elsewhere	83	Sumter	25
		Union	252
		York	15
		Mecklenburg, NC	1
		Elsewhere	84
Total	2,146	Total	4,129
		Worked in county of residence	10,751
	Total nur	iber of Workers residing in county	14,880

## TABLE E-13

#### 1980 WORKER COMMUTING PATTERNS NEWBERRY COUNTY Source: SC Employment Security Commission Labor Market Information Division Based on 1980 Census Data

In-Commuting From		Out-Commuting To		
County	Number	County	Number	
Fairfield	196	Chester	12	
Greenwood	111	Fairfield	279	
Laurens	184	Greenwood	153	
Revised Augu	st 10, 1998			

Lexington	
Richland	
Saluda	•
Union	

Total

1,490

Laurens	923
Lexington	526
Richland	741
Saluda	14
Union	221
Greenville-Spart.	
SMSA	115
(Greenville)	52
(Spartanburg)	12
Augusta, GA	
SMSA	24
Elsewhere	229
Total	3,237
Worked in county	
Of residence	9,548
Total number of	
Workers residing	
in county	13,978

Tables E-14, E-15 and E-16 present 1990 income data for families and households in Newberry County.

## TABLE E-14 1989 HOUSEHOLD AND FAMILY INCOME NEWBERRY COUNTY Source: US Department of Commerce, Bureau of the Census

Database C90STF3a

Income Range	Family	<u>Household</u>
Less than \$5,000	412	1,081
\$5,000 - 9,999	617	1,413
\$10,000 - 14,999	1,010	1,488

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\$15,000 - 19,999	976	1,394
\$20,000 - 29,999	1,903	2,384
\$30,000 - 39,999	1,608	1,954
\$40,000 - 49,000	1,133	1,180
\$50,000 - 59,000	555	602
\$60,000 - 74,999	427	449
\$75,000 - 99,999	256	267
\$100,000 - 149,000	137	137
\$150,000 or more	42	50

#### TABLE E-15

## PER CAPITA, FAMILY AND HOUSEHOLD INCOME FOR 1989 BY CENSUS TRACT NEWBERRY COUNTY Source: <u>Population and Housing Characteristics by Census Tract</u> <u>Richland, Lexington, Fairfield and Newberry Counties</u>

CMRPC, January 1993

	Per Capita	Median	Median
Tract	Income	Household Income	Family Income
9501.00	\$10,926	\$25,951	\$30,947
9502.00	\$11,490	\$24,635	\$29,666
9503.00	\$9,999	\$19,898	\$25,790
9504.00	\$11,962	\$29,167	\$34,643
9505.00	\$8,235	\$19,025	\$23,776
9506.00	\$12,114	\$27,910	\$32,313

## TABLE E-16 PER CAPITA, HOUSEHOLD AND FAMILY INCOME FOR 1989 BY JURISDICTION NEWBERRY COUNTY Source: <u>County and City Data Book</u> for the Central Midlands Region, CMRPC

	Per Cap	oita M	edian	Median
Jurisdiction	Income	He	ousehold Income	Family Income
Newberry County	\$10,487		\$27,961	\$28,005
Little Mountain	\$12,935	\$32,034	\$33,750	
Peak	\$ 9,254	ł	\$20,230	\$18,333
Pomaria	\$11,849	) .	\$31,164	\$35,750
Prosperity	\$10,232	2	\$21,804	\$26,118
Silverstreet	\$ 9,253	<b>;</b> .	\$21,642	\$21,250
Whitmire	<b>\$ 9,97</b> 4	ł	\$21,874	\$22,468
City of Newberry	\$ 9,397	7	\$24,647	\$25,025

Table E-14 shows that a majority of the families and the households earned between \$20,000 and \$49,999. The median household income was \$27,961 and the median family income was \$28,005. According to the figures in Table E-16, Little Mountain had the highest per capita income, and median household income. Pomaria had the highest median family income.

Table E-17 shows the number of families and persons below the poverty level by census tract in Newberry County, and Table E-18 shows the number of families and persons below the poverty level by municipality.

## TABLE E-17 FAMILIES AND PERSON BELOW POVERTY LEVEL BY CENSUS TRACT NEWBERRY COUNTY Source: Population and Housing Characteristics by Census Tract

#### Richland, Lexington, Fairfield and Newberry Counties CMRPC, January 1993

Tract	<b>Families</b>	Percent	Persons	Percent
9501.00	60	10%	284	8.7%
9502.00	204	15.9%	910	12.7%
9503.00	141	14.8%	652	16.5%
9504.00	14	6.0%	70	7.9%
9505.00	474	23.3%	2,314	24.7%
9506.00	153	16.8%	718	9.4%
Total	1,046	11.4%	4,978	15.3%

#### TABLE E-18

## FAMILIES AND PERSONS BELOW POVERTY LEVEL BY JURISDICTION NEWBERRY COUNTY

Source: <u>County and City Data Book for the</u> <u>Central Midlands Region</u> CMRPC, January 1993

	<b>Families</b>	Percent	Persons	Percent
Little Mountain	2	2.9%	11	4.6%
City of Newberry	543	19.9%	2,468	25.2%
Peak	5	20.8%	22	29.7%
Pomaria	4	5.0%	17	6.3%
Prosperity	42	14.2%	194	17.9%
Silverstreet	3	6.5%	26	15.8%
Whitmire	60	12.0%	274	16.2%
Newberry County	1,046	11.4%	4,978	15.3%

The data in Table E-17 indicates that of the 1,046 families below the poverty level, 678 live in census tracts 9502.00 and 9505.00. These are the two census tracts that divide the City of Newberry. According to the data in Table E-18, of the 678 families, 543 reside in the City of Newberry. The same conclusions regarding the number of people below the poverty level can be drawn. In census tracts 9502.00 and 9505.00 there were 3,224 people below the poverty level, 2,468 resided in the City of Newberry. Newberry.

#### 2. Current Manufacturing and Industrial Sites:

The current manufacturing and industrial sites are discussed further under each municipality.

#### 3. Needs and Goals

In 1995, the Strom Thurmond Institute of Government and Public Affairs at Clemson University prepared a report for the Newberry Business Alliance. This report, entitled <u>Fighting Back: The</u> <u>Newberry County Economy in the Late Twentieth Century</u>, identified the following chief assets of the county:

- ?? A location astride Interstate 26 with easy access to growing metropolitan centers like Greenville-Spartanburg and Columbia and proximity to other growth centers like Charlotte and Atlanta;
- ?? Substantial natural, cultural and historic environmental amenities that make Newberry County a pleasant, interesting place to live (Newberry ranked twenty-fifth in the state in a survey of recent retirees locating in the state who were asked about desirable places to retire in South Carolina);
- ?? Relatively low housing costs that help keep the cost of living relatively low in Newberry County, and
- ?? Newberry College, a center of Southern Lutheranism as well as a respected center of higher education.

The report also identified the following liabilities in Newberry County:

- ?? Proximity to large shopping centers with greater variety of offerings and greater possibilities for economies of scales than Newberry can offer;
- ?? Inadequate water and sewer infrastructure to serve development along I-26 and substantial residential growth in the county at large;
- ?? A work force that lacks the training and experience to staff advanced manufacturing facilities;
- ?? Public schools that are perceived to be, at best, mediocre by the standards of the nearby school districts, and
- ?? A relatively thin tax base which limits opportunities to make public investments in schools and infrastructure.

The <u>I-26 Corridor Utility Study: US 176 to Highway 32</u>, stated that " the I-26 Corridor in northwestern Richland County, northern Lexington County and in Newberry County, SC presents outstanding economic development potential. There are eight interchanges along this portion of the I-26 Corridor." Of the eight interchanges studied, six are in Newberry County. The study examines the existing conditions of each interchange as they related to industrial development, including potential industrial sites, and the availability of water and sewer, and their providers, at these sites. Based on the evaluation, recommendations for infrastructure improvements to support future industrial development

are then made. (See the Economic Element map at the end of the chapter for the location of the interchanges.)

<u>Goal for Newberry County</u>: An economic element goal for Newberry County should be to follow the recommendations as outlined in <u>Fighting Back</u> to address the identified liabilities. Additionally, the county should use the <u>I-26 Corridor Utility Study</u> as a guide in improving the infrastructure of potential industrial sites.

B. Peak

1. Inventory:

Table E-19 provides information on the education levels attained by the residents of the Town of Peak. The population for the town declined during the 1980's so it is not surprising that there was a decline among those with at least a high school education. Of particular note was the decrease of those with a high school education but no diploma by 23 people, while those with a college education increased by 21. This shows that the population of the town, as a whole, is better educated. However, the black population had an increase of 4 people with less than a high school education, and a decrease of 5 people with a high school diploma.

## TABLE E-19

## SELECTED EDUCATION INFORMATION FOR PERSONS 25 AND OLDER TOWN OF PEAK Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			•
<9th Grade	14	12	+2
High School	19	40	-21
No Diploma	4	. 27	-23
Graduate	15	13	+2
College	26	. 5	+21
1-3 Years	15	2	+13
4+ Years	11	3	+8
White			
<9th Grade	4	6	-2
High School	16	24	-8
No Diploma	4	. 19	-15
Graduate	12	5	+7
College	26	5	+21
1-3 Years	15	2	+13
4+ Years	11	3	+8
Black			
<9th Grade	10	6	+4
High School	- 3	16	-13
No Diploma	0	8	-8
Graduate	3	8	-5
College	0	0	· 0
1-3 Years	0	0	0
4+ Years	0	0	0
Other			
<9th Grade	0	0	0
High School	0	0	0
No Diploma	0	0	· 0
Graduate	0	0	0
College	0	0	0
1-3 Years	0	0	0
Revised August 10, 1998			· · ·

4+ Years

0

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Table E-20 shows the employment in the town by job sector.

0

#### TABLE E-20

## INDUSTRY OF EMPLOYED PERSON 16 YRS. AND OLDER TOWN OF PEAK

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Sector	<u>1990</u>	<u>1980</u>	Actual Change
Agriculture, Forestry			
Fisheries & Mining	0	0	0
Manufacturing	2	11	-9
Construction	8	3	+5
Transportation	0	3	-3
Communication and			
other Public Utilities	4	4	0
Wholesale/Retail Trade	3	6	-3
Financial/Insurance/Real Estate	0	0	0
Business and Repair Services	0	0.	0
Personal/Entertainment			
and Rec. Services	1	2	-1
Professional and Related Services	5	3	+2
Public Administration	2	0	+2

The only dramatic change was that manufacturing jobs decreased by 9. The only increase were found in construction which increased by 8, professional and related services which increased by 2, and in public administration which increased by 2. The numbers indicate a shift from a manufacturing economy to more a service oriented economy. This trend is better illustrated in table E-21 below, which shows that the only drop in jobs by occupation was found in operators/fabricators/laborers. This category declined from 20 in 1980 to zero in 1990. This may be due to the decline in the textile business. All of the other occupations either stayed at the same number or increased.

#### TABLE E-21

#### OCCUPATION OF EMPLOYED PERSONS 16 YRS. AND OLDER TOWN OF PEAK

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Occupation	<u>1990</u>	<u>1980</u>	Actual Change
Managerial/Professional	7	0	+7
Technical Sales/Adm. Supp.	7	3	+4
Revised August 10, 1998			
		51	

Services	4	2	+2
Farming/Forestry/Fishing	0	0	0
Production Repair	7	7	0
Operators/Fabricators/Labor.	0	20	-20

#### TABLE E-22

## LABOR FORCE STATUS AND UNEMPLOYMENT RATE BY RACE & SEX FOR PERSONS 16 YRS. AND OVER TOWN OF PEAK

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

•	<u>1990</u>	<u>1980</u>	Actual C	hange
Total Population				,
In Labor Force	25	34	-9	
Armed Forces	0	0	0	
Civilian	25	34	-9	
Employed	25	32	-7	
Unemployed	0	2	-2	
Not in Labor Force	41	28	+13	
Unemployment Rate	0%	5.9%		
White				
In Labor Force	21	10	+11	
Armed Forces	0	0	0	
Civilian	21	10	+11	
Employed	21	10	+11	
Unemployed	0	0	0	
Not in Labor Force	32	28	+4	
Unemployment Rate	0%	0%	. ,	
Black				· .
In Labor Force	4	24	-20	
Armed Forces	0 -	0	0	
Civilian	4	24	-20	
Employed	4	22	-18	. •
Unemployed	0	2	-2	
Not in Labor Force	9	0	+9	
Unemployment Rate	0%	8.3%		
Other				
In Labor Force	0	0	0	

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Armed Forces	0	0	0
Civilian	0	0	0
Employed	0	0	0
Unemployed	0	Ó	0
Not in Labor Force	0	0	0
Unemployment Rate	0 -	· 0	0

Table E-22 shows the labor force status and employment rate for those in the town. Of particular interest is that in 1990 the unemployment rate was zero. In contrast, the County's unemployment rate for 1990 was 6.4%. Also significant was that the zero unemployment rate was found in both the white and black populations.

Table E-23 shows the place of work for the residents in the town.

#### TABLE E-23

## PLACE OF WORK BY RESIDENCE FOR WORKERS 16 YRS. AND OVER TOWN OF PEAK

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Worked:	25	37	-12
Inside State	22	. 37	-15
In County	5	31	-26
<b>Outside County</b>	17	6	+9
Outside State	3	0	+3

In 1980, 31 people who lived in the town worked in Newberry County. By 1990, the number had dropped to 5. In contrast, there were only 6 people who worked outside of the county in 1980, yet in 1990 there were 17. The total number of working people dropped by 12. This along with the number of people working outside of the county indicates a decline in regional opportunities for employment within the county. It is likely that those working outside of the county are commuting to the Columbia Metropolitan Area.

Table E-24 shows the household and family income by range for the town.

## TABLE E-24 1989 HOUSEHOLD AND FAMILY INCOME TOWN OF PEAK

#### Source: US Department of Commerce, Bureau of the Census Database C90STF3a

Income Range	Household	<u>Family</u>
Less than \$5,000	7	2
\$5,000 - 9,999	5	· · · 5 ·
\$10,000 - 14,999	2	2
\$15,000 - 19,999	5	5
\$20,000 - 29,999	4	2
\$30,000 - 39,999	5	2
\$40,000 - 49,000	6	6
\$50,000 - 59,000	. 0	0
\$60,000 - 74,999	0	0
\$75,000 - 99,999	0	0
\$100,000 - 149,000	0	0
\$150,000 or more	0	0

According to Table E-24, there were no households nor any families earning more than \$49,000. Table E-16 shows that the town is last in median family and median household income, and is next to last in per capita income.

#### 2. Current Industrial and Manufacturing Sites:

Based on the 1997-1998 South Carolina Industrial Directory published by the South Carolina Department of Commerce, there were no industrial or manufacturing employers in the Town of Peak.

3. Needs and Goals

The economic future of Peak is tied to the economy of the county and the larger economic region. The creation of jobs within commuting distance of the town will provide job opportunities for the residents.
As was pointed out on page 5 in the <u>Analysis of Economic Trends in Newberry County</u>, prepared in November, 1986 by Central Midland Regional Planning Council:

From the standpoint of economic well-being of the people, it is not bad that they are commuting to jobs outside the county....However, from the standpoint of the long term fiscal capacity of the governmental entities in Newberry County to finance the services required by the population, there is a need to look at opportunities to expand the tax base of the County.

The town is too far from any of the interchanges to see any direct economic benefit to the tax base from industrial development along I-26. Additionally, the Newberry County Development Board has not identified any potential sites for development in the town.

<u>Goal for the Town of Peak:</u> An economic element goal for the Town of Peak is to assist in the identification of potential sites for development in an effort to increase the tax base of the town and to provide job opportunities closer to town.

C. Town of Pomaria

#### 1. Inventory

The Town of Pomaria's population increased between 1980 and 1990, so it is not surprising the there was an increase in the number of people with at least a high school education. As the data shows, in the total population, the only decrease occurred in those with less than a high school education. While those with a high school diploma increase by 21, those with some high school education but no diploma increased by 16. This indicates a high drop-out rate, particularly in the black population where the same category increased by 21.

### TABLE E-25 SELECTED EDUCATION INFORMATION FOR PERSONS 25 AND OLDER TOWN OF POMARIA

### Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population		····	· · · · · · · · · · · · · · · · · · ·
<9th Grade	29	41	-12
High School	89	62	+17
No Diploma	40	34	+16
Graduate	49	28	+21
College	58	32	+26
1-3 Years	43	19	+24
4+ Years	15	13	+2
White			
<9th Grade	10	6	+4
High School	42	42	0
No Diploma	6	21	-15
Graduate	36	21	+15
College	41	29	+12
1-3 Years	29	19	+10
4+ Years	12	10	+2
Black		•	
<9th Grade	19	39	-20
High School	47	20	+27
No Diploma	34	13	+21
Graduate	13	7	+6
College	17	3	+14
1-3 Years	14	0	+14
Revised August 10, 1998			

	4+ Years	3	3	0
Other				
<9tl	1 Grade	0	0	0
Hig	h School	0	0	0
•	No Diploma	0	0	0
	Graduate	0	0	0
Col	lege	0	0	0
	1-3 Years	0	0	0
	4+ Years	0	0	0

Table E-26 shows the employment in the town by job sector.

#### TABLE E-26

### INDUSTRY OF EMPLOYED PERSONS 16 YRS. AND OLDER TOWN OF POMARIA

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Sector	<u>1990</u>	<u>1980</u>	Actual Change
Agriculture, Forestry			
Fisheries & Mining	. 2	.3	-1
Manufacturing	34	38	-4
Construction	15	11	+4
Transportation	0	0.	0
Communication and			
other Public Utilities	2	7	-5
Wholesale/Retail Trade	8	13	-5
Financial/Insurance/Real Estate	4	2	+2
Business and Repair Services	6	. 0	+6
Personal/Entertainment			
and Rec. Services	3	11	-8
Professional and Related Services	29	18	+11
Public Administration	9	0	+9

The only dramatic change were the increases in professional and related services and public administration. The only other categories to see an increase were construction, business and repair services, and financial/insurance/real estate. The numbers indicate a shift from a manufacturing economy to more of a service oriented economy. This trend is better illustrated in table E-27 which shows an increase of 18 jobs in the managerial/professional occupations. All of the other occupation either stayed at the same number or increased.

### TABLE E-27

### OCCUPATION OF EMPLOYED PERSONS 16 YRS. AND OLDER TOWN OF POMARIA

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Occupation	<u>1990</u>	<u>1980</u>	Actual Change
Managerial/Professional	27	9	+18
Technical Sales/Adm. Supp.	27	28	-1
Services	15	15	0
Farming/Forestry/Fishing	1	0	+1
Production Repair	23	20	+3
Operators/Fabricators/Labor	31	33	-2

#### TABLE E-28

# LABOR FORCE STATUS AND UNEMPLOYMENT RATE BY RACE & SEX FOR PERSONS 16 YRS. AND OVER TOWN OF POMARIA

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			
In Labor Force	132	113	+19
Armed Forces	0	0	0
Civilian	132	113	+19
Employed	124	105	+19
Unemployed	8	8	0
Not in Labor Force	78	84	-6
Unemployment Rate	6.1%	7.1%	
White			· · ·
In Labor Force	62	61	+1
Armed Forces	0	0	0
Civilian	62	61	+1
Employed	62	61	+1
Unemployed	0	0	0
Not in Labor Force	50	45	+5
Unemployment Rate	0%	0%	

Black

In Labor Force	70	52	+18
Armed Forces	0	0	
Civilian	70	52	+18
Employed	62	44	+18
Unemployed	8	8	0
Not in Labor Force	34	33	+1
Unemployment Rate	11.4%	15.4%	
Other			
In Labor Force	0	0	0
Armed Forces	0	0	0
Civilian	0	0	0
Employed	0	0	0
Unemployed	0	.0	. 0
Not in Labor Force	0	0	0
Unemployment Rate	0	0	0

Table E-28 shows the labor force status and unemployment rate for the town. While the overall unemployment rate dropped from 7.1% to 6.1%, the same number of people were unemployed in 1980 and 1990. In both years, the 8 people unemployed were black.

Table E-29 shows the place of work for the residents in the town.

#### TABEL E-29

### PLACE OF WORK BY RESIDENCE FOR WORKERS 16 YRS. AND OVER TOWN OF POMARIA

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Worked:	122	88	+34
Inside State	120	88	+32
In County	60	51	+9
<b>Outside</b> County	60	37	+23
Outside State	2	0	+2

According to the data, 60 people work outside of the county. This was up from 37 people in 1980. The 60 people represent half of the people who have jobs in the state. Only 2 people in the town have jobs outside of the state.

Table E-30 shows the household and family income by range for the town.

### TABLE E-30 1989 HOUSEHOLD AND FAMILY INCOME TOWN OF POMARIA

Source: US Department of Commerce, Bureau of the Census Database C90STF3a

Income Range	Household	Family
Less than \$5,000	. 5	4
\$5,000 - 9,999	10	0
\$10,000 - 14,999	3	2
\$15,000 - 19,999	14	9
\$20,000 - 29,999	27	20
\$30,000 - 39,999	19	19
\$40,000 - 49,000	12	12
\$50,000 - 59,000	2	2
\$60,000 - 74,999	8	8
\$75,000 - 99,999	4	. 4
\$190,000 - 149,000	0	0
\$150,000 or more	0	0

As was shown earlier in Table E-16, the per capita income was \$11,849, the median household income was \$31,163 and the median family income was \$35,750. The town had the highest median family income among the municipalities in the county, and was second only to the Town of Little Mountain in median household income and per capita income.

#### 2. Current Industrial and Manufacturing Sites:

The following employers have a Town of Pomaria address according to the 1<u>997-1998 South</u> <u>Carolina Industrial Directory</u> published by the South Carolina Department of Commerce. . (See the Economic Element map at the end of the chapter for the location of the sites.)

Name	Classification	Total Employed
Charles K. Doolittle, Inc	Logging	36
James C. Doolittle Logging Co. Inc.	Logging	30
J.H. Leitzsey and Son Inc.	Logging	14
Olin Lominick Hugh, Jr.	Logging	25
A. S. Harris and Son	Logging	25

#### 3. Needs and Goals

A growing segment of the population has to go outside of the county for employment. This indicates that the town is dependent on the economy of the county and the larger economic region. Revised August 10, 1998

While the Newberry County Development Board has not identified any site for potential industrial development near the town, the I-26 /Highway 773 interchange is close enough to have an impact on the town.

<u>Goal for the Town of Pomaria</u>: An economic element goal for the Town of Pomaria is to assist in the infrastructure improvements for the I-26/Highway 773 interchange as identified in the <u>I-26</u> <u>Corridor Study</u>. Additionally, the town should assist the Newberry County Development Board in identifying potential sites for industrial development.

#### D. TOWN OF PROSPERITY

#### 1. Inventory

Table E-31 provides information on the education levels attained by the residents of the Town of Prosperity. Since the population for the town increased between 1980 and 1990, it is not surprising that each education level for the total population also increased. Of significant note was the increase in the white population of high school graduates (+5) and those with a college education (+30), while the number of people with less than a high school education decreased by 13. In contrast, the number of black people with less than a high school education increased by 4 and the number of black people who graduated from high school decreased by 5.

#### TABLE E-31

# SELECTED EDUCATION INFORMATION FOR PERSONS OVER 25 TOWN OF PROSPERITY

Source: U.S. Department of Commerce Bureau of the Census Tape File ST
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	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			
<9th Grade	116	94	+22
High School	394	276	+118
No Diploma	187	147	+40
Graduate	207	129	+78
College	190	147	+43
1-3 Years	92	57	+35
4+ Years	98	90	. +8
White			
<9th Grade	26	39	-13
High School	211	206	+5
No Diploma	61	97	-24
Graduate	150	109	+41
D 1 1 4 . 10 1000			

Revised August 10, 1998

College	160	130	+30
1-3 Years	70	53	+17
4+ Years	90	77	+13
Black			
<9th Grade	90	55 <sup>°</sup>	+35
High School	182	70	+112
No Diploma	126	50	+76
Graduate	56	20	+6
College	29	17	+12
1-3 Years	22	4	+18
4+ Years	7	13	-6
Other			. ,
<9th Grade	0	0	0
High School	. 0	0	0
No Diploma	0	0	0
Graduate	0	0	0
College	0	0	0
1-3 Years	0	0	0
4+ Years	0	0	0

Table E-32 shows the employment in the town by job sector.

### TABLE E-32

# INDUSTRY OF EMPLOYED PERSONS 16 YRS. AND OLDER TOWN OF PROSPERITY

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Sector	<u>1990</u>	<u>1980</u>	Actual Change
Agriculture, Forestry			
Fisheries & Mining	11	4	+7
Manufacturing	202	138	+64
Construction	18	24	-6
Transportation	18	5	+13
Communication and			
other Public Utilities	20	20	0
Wholesale/Retail Trade	93	64	+29
Financial/Insurance/Real Estate	11	18	-7
Business and Repair Services	16	4	+12
Personal/Entertainment			
and Rec. Services	21	8	+13
Revised August 10, 1998			

Professional and Related Services		83	74	+9
Public Administration	•	16	18	-2

Seven of the eleven categories saw an increase in jobs. The largest increase was in manufacturing which increased by 64 jobs. Among the categories that declined, the largest decrease was in the financial/insurance/real estate sector, which decreased by /. The overall growth across the sectors shows a diversified economy. This is also illustrated in Table E-33 below, which shows employment by occupation. Four of the six categories saw an increase in jobs. The largest increase was among operators/fabricators/laborers, which increased by 76 jobs. Of the two that decreased, production/repair decreased by 4 and managerial/professional decreased by three.

#### TABLE E-33

### OCCUPATION OF EMPLOYED PERSONS 16 YRS. AND OLDER TOWN OF PROSPERITY

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Occupation	<u>1990</u>	<u>1980</u>	Actual Change
Managerial/Professional	79	82	-3
Technical Sales/Adm. Supp.	126	95	+31
Services	58	33	+25
Farming/Forestry/Fishing	11	4	+7
Production Repair	60	64	-4
Operators/Fabricators/Labor.	175	99	+76

#### TABLE E-34

# LABOR FORCE STATUS AND UNEMPLOYMENT RATE BY RACE & SEX FOR PERSONS 16 YRS. AND OVER TOWN OF PROSPERITY

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			
In Labor Force	552	387	+165
Armed Forces	2	0	+2
Civilian	550	387	+163
Employed	509	377	+129
Unemployed	41	10	+31
Not in Labor Force	296	210	+86
Unemployment Rate	7.5%	2.6%	

#### White.

In Labor Force	280	269	+11
Armed Forces	2	0	+2
Civilian	278	269	+9
Employed	274	269	+5
Unemployed	4	0	+4
Not in Labor Force	164	154	+10
Unemployment Rate	1.4%	0%	
Black			
In Labor Force	270	118	+152
Armed Forces	0	0	0
Civilian	270	118	+152
Employed	233	108	+125
Unemployed	37	· 10	+27
Not in Labor Force	132	56	+76
Unemployment Rate	13.7%	8.5%	· ·
Other		· ·	
In Labor Force	2	0	+2
Armed Forces	0	0	0
Civilian	2	0	+2
Employed	2	• . 0	+2
Unemployed	0	0	0
Not in Labor Force	0	0	0
Unemployment Rate	0	0	0

Table E-34 shows the labor force status and unemployment rate for the town. In 1980 there were only 10 people unemployed, by 1990, this figure had increased to 41. Of these 41 people, 4 were white and 37 were black. This was despite the fact that of the 552 people in the labor force, 280 were white and 270 were black.

Table E-35 shows the place of wok for the residents in the town.

# TABLE E-35

# PLACE OF WORK BY RESIDENCE FOR WORKERS 16 YRS. AND OVER TOWN OF PROSPERITY

#### Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Worked:	503	307	+196
Inside State	503	307	+196
Revised August 10, 1998		÷.	

In County	384	249		+135
Outside County	119	58		+61
Outside State	0	0	•	0

Of the 503 residents of the town who worked inside the state in 1990, 119 worked outside of Newberry County. This was up from 58 in 1980. Given the town's proximity to Richland County, it is likely that these people are working in the Columbia Metropolitan Area.

Table E-36 shows the household and family income for the town by range.

### TABLE E-36 1989 HOUSEHOLD AND FAMILY INCOME TOWN OF PROSPERITY

Source: US Department of Commerce, Bureau of the Census Database C90STF3a

Income Range	Household	Family
Less than \$5,000	32	21
\$5,000 - 9,999	60	31
\$10,000 - 14,999	52	30
\$15,000 - 19,999	43	31
\$20,000 - 29,999	79	57
\$30,000 - 39,999	53	43
\$40,000 - 49,000	38	30
\$50,000 - 59,000	22	19
\$60,000 - 74,999	22	20
\$75,000 - 99,999	7	7
\$100,000 - 149,000	4	4
\$150,000 or more	2	2

As was shown in Table E-16, the per capita income was \$10,232, the median household income was \$21,804 and the median family income was \$26,118. Prosperity ranked third in per capita income and median family income, and fifth in median household income. Table E-36 shows a wide range of incomes with 2 households and families earning more than \$150,000.

#### 2. Current Industrial and Manufacturing Sites:

The following employers have a Town of Prosperity address according to the 1997-1998 South Carolina Industrial Directory published by the South Carolina Department of Commerce. (See the Economic Element map at the end of the chapter for the location of the sites.)

Name	Classification	Total	Employed
A&L Logging Inc.	Logging		11
John S. Brooks Logging Inc.	Logging	÷	1
Counts Sausage Co, Inc	Pork and Beef Products		35
Georgia-Pacific Corp.	Lumber and Chips		90
Georgia Pacific	Southern Pine Plywood	277	· · · ·
-	Pine Wood Chips		
	Pine Cores		
International Paper	Extrusion Coated Paperbo	ard	74
McKechnie Group	Wheel Covers-Automobile	Industry	250
Redline Precision Machining	Machine Shop		13
-	Fabrication		
	Extrusion Dies		· ·
	Custom Machines		

#### 3. Needs and Goals

The economic future of Prosperity is tied to the economy of the county and the larger economic region. The creation of jobs within commuting distance of the town will provide job opportunities for the residences. If the town can maintain and enhance the environment as an attractive and desirable place to live, it should continue to attract residents who may commute to jobs inside and outside of the county.

The Newberry County Development Board has identified the following sites for potential industrial development near the town: (See the Economic Element map at the end of the chapter for the location of the sites.)

Name	Location	Acres
Bedenbaugh Site	U.S. Highway 76	252
Ruff Site	U.S. Highway 76	25
Watts Site	U.S. Highway 76	81.5

The I-26/Highway 773 interchange offers potential sites for development which could benefit the town.

<u>Goal for the Town of Prosperity</u>: An economic element goal for the Town of Prosperity to assist in the development of the sites identified by the Newberry County Development Board as well as assisting in the infrastructure improvements of the I-26/Highway 773 interchange as identified in the <u>I-26 Corridor</u> Study.

#### E. TOWN OF SILVERSTREET

1. Inventory

Table E-37 provides information on the education levels attained by the residents of the Town of Silverstreet. In the total population, the biggest change was in those who graduated high school which increased by 20 people. Most of this increase was found in the white population where those who graduated from high school increased by 15. The other significant trend was in the black population in which those with a college education went from zero in 1980 to 8 in 1990.

# TABLE E-37 SELECTED EDUCATION INFORMATION FOR PERSON S OVER 25 TOWN OF SILVERSTREET

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			
<9th Grade	13	21	-8
Revised August 10, 1998			

High School	71	65	+6
No Diploma	27	27	0
Graduate	44	24	+20
College	41	50	<b>-9</b>
1-3 Years	22	24	-2
4+ Years	19	26	-7
White			
<pre>&lt;9th Grade</pre>	13	5	+8
High School	61	60	+1
No Diploma	24	38	-14
Graduate	37	22	+15
College	33	50	-17
1-3 Years	17	24	-7
4+ Years	16	26	-10
Black			
<pre><pre><pre><pre><pre><pre><pre><pre></pre></pre></pre></pre></pre></pre></pre></pre>	0	16	-16
High School	10	5	+5
No Diploma	3	3	0
Graduate	7	2	+5
College	8	0	+8
1-3 Years	5	0	+5
4+ Years	3	0	+3
Other			<i>:</i>
<pre><pre><pre><pre><pre><pre><pre>Grade</pre></pre></pre></pre></pre></pre></pre>	0	0	0
High School	0	0	0
No Diploma	0	0	0
Graduate	0	0	0
College	0	0	0
1-3 Years	0	0	0
4+ Years	0	0	0

Table E-38 shows the employment in the town by job sector.

# TABLE E-38 INDUSTRY OF EMPLOYED PERSONS 16 YRS. AND OLDER TOWN OF SILVERSTREET

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Sector	<u>1990</u>	<u>1980</u>	Actual Change	
Agriculture, Forestry				
Revised August 10, 1998				÷.,

Fisheries & Mining	0	6	-6
Manufacturing	7	23	-16
Construction	6	8	-2
Transportation	. 9	4	+5
Communication and			
other Public Utilities	1	0	+1
Wholesale/Retail Trade	7	22	-15
Financial/Insurance/Real Estate	8	3	+5
Business and Repair Services	0	4	-4.
Personal/Entertainment			
and Rec. Services	2	2	0
Professional and Related Services	12	17	-5
Public Administration	. 3	3	0

Six of the 11 categories declined in jobs. Of these six, the biggest decreases were in manufacturing which dropped by 16, and wholesale/retail trade which dropped by 15. The biggest increases were in transportation and financial/insurance/real estate, both of which increased by 5. Personal/entertainment and recreational services stayed the same between 1980 and 1990. As the numbers indicated, all sectors of the economy suffered. This is clearly illustrated in Table E-39 which shows a decline in every occupation category. The biggest decline was in operators/fabricators/laborers which dropped by 11.

### TABLE E-39

# OCCUPATION OF EMPLOYED PERSONS 16 YRS. AND OLDER TOWN OF SILVERSTREET

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

<u>Occupation</u>	<u>1990</u>	<u>1980</u>	Actual Change
Managerial/Professional	14	18	-4
Technical Sales/Adm. Supp.	22	24	-2
Services	4	9	-5
Farming/Forestry/Fishing	0	6	-6
Production Repair	8	17	-9
Operators/Fabricators/Labor.	7	18	+11

#### TABLE E-40

### LABOR FORCE STATUS AND UNEMPLOYMENT RATE BY RACE & SEX FOR PERSONS 16 YRS AND OVER TOWN OF SILVERSTREET

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			••••
In Labor Force	55	97	-42
Armed Forces	0	0	0
Civilian	55	97	-42
Employed	55	92	-37
Unemployed	0	5	-5
Not in Labor Force	80	62	+18
Unemployment Rate	0%	5.2%	
White			
In Labor Force	47	85	-38
Armed Forces	0	0	0
Civilian	47	85	-38
Employed	47	85 -	-38
Unemployed	0	0	0
Not in Labor Force	70	46	+24
Unemployment Rate	0%	0%	
Black			•
In Labor Force	8	12	-4
Armed Forces	0	0	0
Civilian	8	12	-4
Employed	8	7	+1
Unemployed	0	5	-5
Not in Labor Force	10	16	-6
Unemployment Rate	0%	41.7%	
Other			
In Labor Force	0	0	0
Armed Forces	0	0	0
Civilian	0	0	0
Employed	0	0	0
Unemployed	0	0	0
Not in Labor Force	0	0	• 0
Unemployment Rate	0	0	0

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Table E-40 shows the labor force and unemployment rate for the town. Of particular interest is that despite the decline in jobs by employment sector and occupation, the unemployment rate for 1990 Revised August 10, 1998

was zero. It should also be noted that in the black population, the number of unemployed persons in 1980 was 5. By 1990, the number had dropped to zero.

Table E-41 shows the place for work for the residents in the town.

### TABLE E-41

### PLACE OF WORK BY RESIDENCE FOR WORKERS 16 YRS. AND OVER TOWN OF SILVERSTREET

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Worked:	55	75	-20
Inside State	55	75	-20
In County	44	69	-25
<b>Outside</b> County	11	6	+5
Outside State	0	0	0

The total number of people living in the town who were employed decreased from 75 to 55. Of the 55 working people in the town, 44 worked inside the county, which was down from 69 people in 1980. There were eleven people who worked outside of Newberry County 1990. This was up from 6 in 1980.

Table E-42 shows the household and family income by range for the town.

# TABLE E-42

### 1989 HOUSEHOLD AND FAMILY INCOME TOWN OF SILVERSTREET

Source: US Department of Commerce, Bureau of the Census Database C90STF3a

Income Range	Household	Family
Less than \$5,000	13	3
\$5,000 - 9,999	5	0
\$10,000 - 14,999	21	18
\$15,000 - 19,999	5	2
\$20,000 - 29,999	10	10
\$30,000 - 39,999	5	2
\$40,000 - 49,000	3	3.
\$50,000 - 59,000	4	4
\$60,000 - 74,999	4	4
\$75,000 - 99,999	0	0
\$100,000 - 149,000	0	0
\$150,000 or more	Ó	0

As was shown earlier in Table E-16, the per capita income was \$9,253, the median household income was \$21,642 and the median family income was \$21,250. The town had the lowest per capita income, and was sixth in median household income and median family income. As Table E-33 shows, no family earned more than \$75,000.

#### 2. Current Industrial and Manufacturing Sites:

The following employer has a Town of Silverstreet address according to the 1<u>997-1998 South</u> <u>Carolina Industrial Directory</u> published by the South Carolina Department of Commerce. (See the Economic Element map at the end of the chapter for the location of the sites.)

Name Newberry Chip Mill <u>Classification</u> Wood Chips Hardwood Chips

### Total Employed 8

#### 3. Needs and Goals

The economic future of Silverstreet is tied to the economy of the county and the larger economic region. The creation of jobs within commuting distance of the town will provide job opportunities for the residences.

As of 1990, the town had zero unemployment and only eleven people commuting outside of the county for work. The closest sites for potential development identified by the Newberry County Revised August 10, 1998

Development Board are near the City of Newberry, so there would be some benefit to the town of Silverstreet if these sites were developed. Continuing job growth in Greenwood County is also beneficial to Silverstreet. Residents can easily commute to jobs both in Greenwood and Newberry County.

<u>Goal for the Town of Silverstreet</u>: An economic element goal for the Town of Silverstreet is recognize and be supportive of economic development in Newberry County and the Central Midlands region.

#### F. TOWN OF WHITMIRE

#### 1. Inventory

Table E-43 provides information on the education levels attained by the residents of the Town of Whitmire. The most dramatic change was the decrease in the number of those with less than a high school education among the total population. This coupled with the increase in the number of high school and college graduates indicates a more educated population. However, there were still 647 people without a diploma.

# TABLE E-43 SELECTED EDUCATION INFORMATION FOR PERSONS 25 AND OLDER TOWN OF WHITMIRE

### Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			· · ·
<9th Grade	382	646	-281
High School	626	567	+59
No Diploma	265	296	-31
Graduate	<b>36</b> 1	271	+90
College	230	190	+40
1-3 Years	132	119	+13
4+ Years	98	72	+26
White			
<9th Grade	314 .	537	-223
High School	537	490	+47
No Diploma	212	263	-51
Graduate	325	227	+98
College	196	174	+22
1-3 Years	102	108	-6
4+ Years	94	66	+28
Black			
<9th Grade	66	109	-43
High School	88	77	+11
No Diploma	53	33	+20
Graduate	35	44	-9
College	34	17	-17
1-3 Years	30	11	+19
4+ Years	4	6	-2
Other			· .
<9th Grade	2	0	+2
High School	1	0	+1
No Diploma	0	0	0
Graduate	1	0	+1
College	0	0	0
1-3 Years	0	0	. 0
Revised August 10, 1998			

4+ Years

0

n

Table E-40 shows the employment of the residents of the town by job sector.

0

### TABLE E-44 INDUSTRY OF EMPLOYED PERSONS 16 YRS. AND OLDER TOWN OF WHITMIRE

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Sector	<u>1990</u>	<u>1980</u>	Actual Change
Agriculture, Forestry			
Fisheries & Mining	5	9	-4
Manufacturing	330	644	-314
Construction	46	40	+6
Transportation	20	14	+6
Communication and			
other Public Utilities	17	9	+8
Wholesale/Retail Trade	13	82	-69
Financial/Insurance/Real Estate	130	15	+115
Business and Repair Services	11	10	+1
Personal/Entertainment			· · ·
and Rec. Services	14	26	-12
Professional and Related Services	117	118	-1
Public Administration	26	23	+3

The most significant change was the decline in employment in manufacturing by 314. Five of the eleven categories saw a decline in jobs. Of the six that saw an increase, the biggest gain was in the financial/insurance/real estate sector which increased by 115 jobs. Based on the data, the economy is shifting away from manufacturing. This is also illustrated in Table E-45 which shows jobs by occupation in the town. Five of the six categories lost jobs. The only category to gain was farming/forestry/fishing which increased by one. However, the biggest decline was among operators/fabricators/labors which decreased by 199 jobs.

### **TABLE E-45**

### OCCUPATION OF EMPLOYED PERSONS 16 YRS. AND OLDER TOWN OF WHITMIRE

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Occupation	<u>1990</u>	<u>1980</u>	Actual Change
Managerial/Professional	106	110	-4
Revised August 10, 1998			

Technical Sales/Adm. Supp.	160	162	-2
Services	73	117	-44
Farming/Forestry/Fishing	9	8	+1
Production Repair	102	117	-15
Operators/Fabricators/Labor.	277	476	-199

# TABLE E-46

# LABOR FORCE STATUS AND UNEMPLOYMENT RATE BY RACE & SEX FOR PERSONS 16 YRS. AND OVER TOWN OF WHITMIRE

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

. · · ·	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			
In Labor Force	787	1,019	-232
Armed Forces	10	2	+8
Civilian	777	1,017	-240
Employed	727	990	-263
Unemployed	50	27	+23
Not in Labor Force	608	636	+28
Unemployment Rate	6.4%	2.7%	
White			
In Labor Force	668	882	-214
Armed Forces	10	2	+8
Civilian	658	880	-222
Employed	625	855	-230
Unemployed	- 33	25	+8
Not in Labor Force	506	521	-15
<b>Unemployment Rate</b>	5.0%	2.8%	.÷
Black			
In Labor Force	119	137	-18
Armed Forces	0	0	0
Civilian	119	137	-18
Employed	102	135	-33
Unemployed	17	2	+15
Not in Labor Force	99	115	-16
Unemployment Rate	14.3%	1.5%	

Other				•
In Labor Force	0	0		0
Armed Forces	0	0	0	
Civilian	<b>0</b>	0		0
Employed	0	0		-0
Unemployed	0	0		0
Not in Labor Force	3	0		+3
Unemployment Rate	0	0		0

Table E-46 shows labor force status and the unemployment rate for the town. The most significant trend was the rise in the unemployment rate, especially in the black population which went from 1.5% in 1980 to 14.3% in 1990.

Table E-47 shows the place of work for the residents in the town.

### TABLE E-47 PLACE OF WORK BY RESIDENCE FOR WORKERS 16 YRS. AND OVER TOWN OF WHITMIRE

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Worked:	718	934	-216
Inside State	707	928	-221
In County	329	664	-335
<b>Outside County</b>	378	264	+114
Outside State	11	· 6	+5

In 1990, 378 people worked outside of the County while only 329 people worked inside the County. In 1980, 664 people worked inside the County and only 264 people worked outside of the County. The decline in textile related employment throughout the state is very evident in Whitmire.

Table E-48 shows the household and family income by range for the town.

### TABLE E-48 1989 HOUSEHOLD AND FAMILY INCOME TOWN OF WHITMIRE

Source: US Department of Commerce, Bureau of the Census Database C90STF3a

Income Range	Household	Families
Less than \$5,000	76	21
\$5,000 - 9,999	131	45
\$10,000 - 14,999	133	86
\$15,000 - 19,999	94	59
\$20,000 - 29,999	131	105
\$30,000 - 39,999	· 99	83
\$40,000 - 49,000	63	60
\$50,000 - 59,000	16	16
\$60,000 - 74,999	17	15
\$75,000 - 99,999	2	2
<b>\$100,000 - 149,000</b>	5	5
\$150,000 or more	2	2

As was shown in Table E-16, the per capita income was \$9,974, the median household income was \$21,874 and the median family income was \$22,468. The town was fourth in per capita income and median household income, and was fifth in median family income.

#### 2. Current Industrial and Manufacturing Sites:

The following employers have a Town of Whitmire address according to the 1997-1998 South Carolina Industrial Directory published by the South Carolina Department of Commerce. (See the Economic Element map at the end of the chapter for the location of the sites.)

NameClassificationTotal EmployedArmfield's Printing Inc.Commercial Printing, Litho.7Revised August 10, 19987

Renfro FL, Inc. Hoisery West Point Stevens, Inc Whitmire News and Journal/Turner Publishing 400 Yam Plant Newspaper/Desktop publishing 1

327

#### 3. Needs and Goals

The economic future of Peak is tied to the economy of the county and the larger economic region. The creation of jobs within commuting distance of the town will provide job opportunities for the residences. The town should capitalize on its ability to provide urban services by developing a desirable environment to live and work. The number of residents commuting to jobs in adjoining counties testifies to the desirability of Whitmire as a place to live.

<u>Goal for the Town of Whitmire</u>: An economic goal for the Town of Whitmire is to position itself as a desirable place to live for people taking advantage of economic opportunities in the region.

#### G. TOWN OF LITTLE MOUNTAIN

#### 1. Inventory

Table E-49 provides information on the education levels attained by the residents of the Town of Little Mountain. Those who graduated from high school increased by 32 and those with some college education increased by 25. Additionally, those without a high school diploma decreased by 53. This would indicate a more educated population. However, in the black population, those who went to high school, but did not graduate increased by 2, and there were no one reported with a college education.

### TABLE E-49 SELECTED EDUCATION INFORMATION TOWN OF LITTLE MOUNTAIN Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			
<9th Grade	3	40	+37
High School	- 91	75	+16
No Diploma	21	37	-16
Graduate	70	38	+32
College	70	45	+35
1-3 Years	46	21	+25
4+ Years	24	24	0
White			
<9th Grade	0	14	-14
High School	78	66	+12
No Diploma	17	35	-18
Graduate	61	31	+30
College	70	45	+25
1-3 Years	46	21	+25
4+ Years	24	24	0
Black			
<9th Grade	3	26	-23
High School	13	9	+4
No Diploma	4	2	+2
Graduate	9	7	+2
College	0	, 0	0
Revised August 10, 1998	v	<b>v</b> .	<b>~</b>

1-3 Years	0	0	0
4+ Years	0	0	0
Other			
<9th Grade	0	0	0
High School	0	0	0
No Diploma	0	0	0
Graduate	0	0	0
College	0	0	0
1-3 Years	0	0	0
4+ Years	0	0	0

Table E-50 shows the employment for residents of the town by job sector.

# TABLE E-50 1990 EMPLOYMENT IN JOBS BY SECTOR TOWN OF LITTLE MOUNTAIN

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Sector	<u>1990</u>	<u>1980</u>	Actual Change
Agriculture, Forestry			
Fisheries & Mining	6	2	+4
Manufacturing	.25	28	-3
Construction	6	6	0
Transportation	8	2	+6
Communication and			
other Public Utilities	18	14	+4
Wholesale/Retail Trade	16	15	+1
Financial/Insurance/Real Estate	8	5	+3
Business and Repair Services	4	4	0
Personal/Entertainment			
And Rec. Services	7	8	-1
Professional and Related Services	18	29	-11
Public Administration	8	9	-1

Of the eleven categories, 5 increased in jobs, 4 decreased in jobs and one stayed the same. The biggest decrease was in professional and related services, which lost 11 jobs. The biggest increase was in transportation, which gained 6 jobs. The sector with the most jobs in 1980 and 1990 was manufacturing. The numbers indicated that the employment sectors for the residents remained stable Revised August 10, 1998

during the ten years. This is also illustrated in Table E-51 which shows employment by occupation. Three of the five categories decreased in jobs, while the other two increased. The biggest decrease was in technical sales/administrative support, which lost 4 jobs. The biggest increase was in production/repair which gained 6 jobs.

### TABLE E-51 1990 EMPLOYMENT BY OCCUPATION TOWN OF LITTLE MOUNTAIN Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

•		-	

Managerial/Professional 27 28 -1	
Technical Sales/Adm. Supp. 38 42 -4	
Services 17 16 +1	
Farming/Forestry/Fishing 5 2 +3	
Production Repair 15 9 +6	
Operators/Fabricators/Labor. 22 25 -3	

### TABLE E-52

# LABOR FORCE STATUS AND UNEMPLOYMENT RATE BY RACE & SEX FOR PERSONS 16 YRS. AND OVER TOWN OF LITTLE MOUNTAIN

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	1990	1980	Actual Change
Total Population			· · · · · ·
In Labor Force	128	122	+6
Armed Forces	0	0	<b>O</b> .
Civilian	128	122	+6
Employed	124	122	+2
Unemployed	4	0	+4
Not in Labor Force	64	102	-38
<b>Unemployment Rate</b>	3.1%	0%	
White			
In Labor Force	110	108	+2
Armed Forces	0	0	0
Civilian	110	108	+2
Employed	106	108	-2
Unemployed	4	0	+4
Not in Labor Force	60	57	+3
<b>Unemployment Rate</b>	3.6%	0%	
Revised August 10, 1998			

Black				
In Labor Force	18	14		+4
Armed Forces	. 0	0.	0	
Civilian	18	14		+4
Employed	18	14		+4
Unemployed	. 0	Q		0
Not in Labor Force	4	45		-41
Unemployment Rate	0%	0%		
Other				
In Labor Force	0	0		0
Armed Forces	0	0	0	
Civilian	0	0		0
Employed	0	0		0
Unemployed	0	0	• .	0.
Not in Labor Force	0	0		0
<b>Unemployment Rate</b>	• 0	0		0

Table E-52 shows the labor force status and unemployment rate for the town. The most noticeable change was that the unemployment rate went from zero in 1980 to 3.1% in 1990. The labor force increased by six between 1980 and 1990. Of these six people, four were unemployed. According to the data, all of them were white.

Table E-53 shows the place of work for the residents in the town.

#### TABLE E-53

# PLACE OF WORK BY RESIDENCE FOR WORKERS 16 YRS. AND OVER TOWN OF LITTLE MOUNTAIN

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Worked:	124	120	+4
Inside State	124	117	+7
In County	44	30	+14
Outside County	80	87	-7
Outside State	0	3	-3

In 1990, there were 124 people who worked in the state. Of this figure, 80 worked outside the county. This was down from 87 in 1980.

Table E-54 shows the household and family income by range.

### TABLE E-54 1989 HOUSEHOLD AND FAMILY INCOME TOWN OF LITTLE MOUNTAIN Source: US Department of Commerce, Bureau of the Census Database C90STF3a

Income Range	Household	Family
Less than \$5,000	9	2
\$5,000 - 9,999	2	0
\$10,000 - 14,999	10	8
\$15,000 - 19,999	14	4
\$20,000 - 29,999	18	13
\$30,000 - 39,999	15	14
\$40,000 - 49,000	10	. 10
\$50,000 - 59,000	3	3
\$60,000 - 74,999	<b>8</b>	8
\$75,000 - 99,999	4	· 4
\$100,000 - 149,000	2	2
\$150,000 or more	0	0

As was shown in Table E-16, the per capita income was \$12,935, the median household income was \$32,034 and the median family income was \$33,750. The town ranked first in per capita income and median household income, and ranked second in median family income. According to the data in Table E-54 a majority of the families and households had an income between \$20,000 and \$49,000, which mirrors the income data for the county.

2. Current Industrial and Manufacturing Sites:

The following employers have a Town of Little Mountain address according to the 1<u>997-1998</u> <u>South Carolina Industrial Directory</u> published by the South Carolina Department of Commerce. (See the Economic Element map at the end of the chapter for the location of the sites.)

Name	<b>Classification</b>	<b>Total Employed</b>
Derrick Lumber Co. Inc.	Sawmill and Planing Mill	20
Pleasurecraft Marine Engine Co.	Marine Engines	28
_	Marine Transmissions	
	Marine Parts & Accessories	

#### 3. Needs and Goals

The jobs available to residents of the town are stable, and despite a growing unemployment rate, only 4 people in 1990 were unemployed. Clearly, many of the commuters are taking advantage of economic opportunities in the Columbia Metropolitan Area. The town may want to encourage industrial development within Newberry County to provide greater opportunity for its residents, and to attract newer residents. The Bedenbaugh Site and the Watts Site, mentioned in an earlier section, are close enough to benefit the town. Also, the town is very close to the I-26/Highway 202 interchange, which could also be developed.

The economic future of Peak is tied to the economy of the county and the larger economic region. The creation of jobs within commuting distance of the town will provide job opportunities for the residences.

Goal for the Town of Little Mountain: Economic goals for the Town of Little Mountain are:

- ?? to continue to be an attractive "bedroom" community;
- ?? to encourage the development of the two sites identified earlier, and
- ?? to encourage the infrastructure improvements at the I-26/Highway 202 interchange as recommended in the <u>I-26 Corridor Study</u>.

#### H. CITY OF NEWBERRY

#### 1. Inventory

Table E-55 provides information on the education levels attained by the residents of the City of Newberry. While the number of people who graduated from high school increased by 796 people and those who have attended college increased by 56 people, the number of people with some high school education but not a diploma increased by 71. For this category to have increased during the decade indicates that drop-outs are a problem in Newberry. In 1990, there were 2,521 adults without a high school diploma. Of the 2,521 people, 1,149 were white and 1,250 were black.

# TABLE E-55

### SELECTED EDUCATION INFORMATION FOR PERSONS 25 AND OLDER CITY OF NEWBERRY

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population		·	
<9th Grade	1,207	1,841	-634
High School	3,227	2,360	+867
No Diploma	1,314	1,243	+71
Graduate	1,913	1,117	+796
College	2,020	1,860	+160
1-3 Years	1,067	743	+324
4+Years	953	1,117	-164
White			
<9th Grade	650	1,046	-396
High School	1,797	1,683	+114
Revised August 10, 1998	-		

No Diploma	599	874	-275
Graduate	1,198	809	+389
College	1,677	1,621	+56
1-3 Years	797	652	+145
4+Years	880	969	-89
Black			
<9th Grade	535	780	-245
High School	1,416	677	+739
No Diploma	715	369	+346
Graduate	701	308	+393
College	343	239	+104
1-3 Years	270	91	+179
4+ Years	73	148	-75
Other			
<9th Grade	22	15	+7
High School	14	0	+14
No Diploma	0	0	. 0
Graduate	14	0	+14
College	0	0	0
1-3 Years	0	0	0
4+Years	0	0	0

Table E-56 shows the employment in the town by job sector.

# TABLE E-56

# INDUSTRY OF EMPLOYED PERSONS 16 YRS. AND OLDER CITY OF NEWBERRY

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Sector	<u>1990</u>	<u>1980</u>	Actual Change
Agriculture, Forestry			
Fisheries & Mining	61	82	-21
Manufacturing	1,234	1,273	-39
Construction	168	288	-120
Transportation	172	117	+55
Communication and			
other Public Utilities	119	102	+17
Wholesale/Retail Trade	770	244	+526
Financial/Insurance/Real Estate	166	751	-585
Revised August 10, 1998			

Business and Repair Services	120	161	-41
Personal/Entertainment			. •
and Rec. Services	144	47	+97
Professional and Related Services	1,007	979	+28
Public Administration	184	212	-28

Six of the eleven categories lost jobs. The biggest decline was in financial/insurance/real estate, which lost 585 jobs. Of the five categories that saw an increase, the biggest increase was in wholesale/retail trade which gained 585 jobs. Based on the data, the economy of the city was stable. This is also illustrated in Table E-57 which shows employment by occupation. While three of the 5 categories declined in jobs, the biggest decrease was in managerial/professional occupation which lost 230 jobs. The category with the biggest increase was in services, which gained 81 jobs.

### TABLE E-57

### OCCUPATION OF EMPLOYED PERSONS 16 YRS. AND OLDER CITY OF NEWBERRY

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Occupation	<u>1990</u>	<u>1980</u>	Actual Change
Managerial/Professional	840	1,070	-230
Technical Sales/Adm. Supp.	1,068	1,085	-17
Services	622	541	+81
Farming/Forestry/Fishing	64	56	+8
Production Repair	428	589	-161
Operators/Fabricators/Labor.	1,132	1,059	+73

#### TABLE E-58

## LABOR FORCE STATUS AND UNEMPLOYMENT RATE BY RACE & SEX FOR PERSONS 16 YRS. AND OVER CITY OF NEWBERRY

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

	<u>1990</u>	<u>1980</u>	Actual Change
Total Population			
In Labor Force	4,587	4,665	-78
Armed Forces	14	16	-2
Civilian	4,573	4,649	-76
Employed	4,154	4,400	-246
Unemployed	419	249	+170
Not in Labor Force	3,501	3,287	+214
Unemployment Rate	9.2%	5.4%	
Revised August 10, 1008			

White			
In Labor Force	2,762	3,320	-558
Armed Forces	14	16	-2
Civilian	2,748	3,304	-556
Employed	2,617	3,162	-545
Unemployed	131	142	-11
Not in Labor Force	2,297	2,228	+69
Unemployment Rate	4.8%	4.3%	
Black			
In Labor Force	1,818	1,339	+479
Armed Forces	0	0	0
Civilian	1,818	1,339	+479
Employed	1,530	1,238	+292
Unemployed	288	101	+187
Not in Labor Force	1,175	978	+197
<b>Unemployment Rate</b>	15.8%	7.5%	
Other			
In Labor Force	7	6	+1
Armed Forces	0	0	. 0
Civilian	7	6	+1
Employed	7	0	+7
Unemployed	0	6	-6
Not in Labor Force	29	21	+8
Unemployment Rate	0	100%	

Table E-58 shows the labor force status and unemployment rate for the town in 1980 and 1990. The number of unemployed people increased from 249 people in 1980 to 419 people in 1990. This resulted in an unemployment rate of 9.2% in 1990. Of the 419 people, 288 were black, which resulted in an unemployment rate in the black population of 15.8%. It should be noted that between 1980 and 1990, the black population increased by 1,193 people, while the white population decreased by 537 people.

Table E-59 shows the place of work for the residents of the town.

### TABLE E-59 PLACE OF WORK BY RESIDENCE FOR WORKERS 16 YRS. AND OVER CITY OF NEWBERRY

	1000		
	<u>1990</u>	<u>1980</u>	Actual Change
Worked:	4,081	3,958	+123
Inside State	4,081	3,925	+156
In County	3,473	3,441	+32
Outside County	608	484	+124
Outside State	0	33	-33

Source: U.S. Department of Commerce Bureau of the Census Tape File STF3A

Of the 4,081 workers in 1990, only 608 worked outside of the county. This was up from 484 in 1980. Since the city is located near the center of the county, the location of the jobs is uncertain.

Table E-60 shows the family and household income by ranges for the city. In 1989, there were 24 households and 16 families with an income over \$150,000. As was shown in Table E-16, the per capita income was \$9,397, the median household income was \$24,,647 and the median family income was \$25,025. The city ranked third in median household income, fourth in median family income and fifth in per capita income. According to the data in Table E-18, there were 543 families and 2,468 persons below the poverty level.

### TABLE E-60 1989 HOUSEHOLD AND FAMILY INCOME CITY OF NEWBERRY Source: US Department of Commerce, Bureau of the Census Database C90STF3a

Income Range	Household	<b>Family</b>
Less than \$5,000	537	235
\$5,000 - 9,999	570	274
\$10,000 - 14,999	560	367
\$15,000 - 19,999	377	250
\$20,000 - 29,999	796	606
\$30,000 - 39,999	483	392
---------------------	-----	-----
\$40,000 - 49,000	280	254
\$50,000 - 59,000	143	134
\$60,000 - 74,999	107	107
\$75,000 - 99,999	57	57
\$100,000 - 149,000	34	34
\$150,000 or more	24	16

# 2. Current Industrial and Manufacturing Sites:

The following employers have a the City of Newberry address according to the 1997-1998 South Carolina Industrial Directory published by the South Carolina Department of Commerce. (See the Economic Element map at the end of the chapter for the location of the sites.)

Name	Classification	Total Employed
American Fiber & Finishing	Woven Lightweight	697
e e e e e e e e e e e e e e e e e e e	Industrial Fabrics	
ArtiChill Inc	Water Chillers	36
	Cooling Towers	
Carolina Concrete Co. Inc.	Ready-mixed Concrete	8
Champion Timberlands Pu	ulpwood 15	
Cousins Ag Products, Inc	Fertilizer Mixing	7
Dickert Lumber Co. Inc.	Lumber	62
	Shavings Chips Sawdust	
John R. Frazier, Inc.	Pulpwood	7
	Timber	
Glassmaster CoIndustrial Products Div.	Fiberglass Products	30
	Marine Antennas	
M L Haltiwanger Lumber Co., Inc.	Lumber	19
International Paper	Lumber	172
	Wood By-products	
ISE Newberry, Inc	Egg Process & Egg Products	120
	Poultry Feed	
Lakewood Treating Inc.	Wood Preserving	10
William B. Lominick Logging, Inc.	Logging	4
Louis Rich	Processed Turkey	1,400
	Fresh & Frozen Turkey Parts	&
· · · ·	Products	
MCP DaviSound	Professional Audio Equipment	3
· · ·	Radio Advertising-Commercia	1
	Industrial Sound System/Desig	m

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	Fabrication-Install		
Metal Master, Inc.	Precision Machine Parts		45
,	Process Pipe		
	Steel Fabrication		
Newberry Feed & Farm Center, Inc.	Animal Feed		17
·····, -···, -···, -···	Chicken & Turkey Feed		
Newberry Machine & Welding Shop	Machine Shop & Welding		2
Newberry Observer	Newspapers		36
·····	Commercial Web Printing		
Newberry Publishing Co.	Commercial Web Printing		32
Palmetto Pallet Co., Inc	Wood Pallets		23
,	Pre-cut Pallet Stock		
Precision Fiberglass Industries, Inc.	Fiberglass Reinforced Plastics	80	
× ••••=================================	Fiberglass Solid Rods	00	
. · · · ·	Fiberglass Tubes		
Ouality Stitching, Inc.	Activewear-Men 150		
	Activewear-Ladies		•
	Boxer Shorts		
· · ·	Blouses & Pants-Ladies		
Quality Wood Recycling, Inc.	Wood Pallets (repair)	• • •	46
	Landscape Mulch		
Quality Woodtruss, Inc.	Wood Roof Trusses		12
	Wood Louvered Vents		
	Misc. Wood Products		
Quality Woodworks, Inc.	Pallets & Skids		15
	Crates & Boxes		
	Machine Shipping Bases		
Sea-Pro Boats, Inc.	Boat Building and Repair		<b>7</b> 5
Shakespeare Electronics & Fiberglass	FRP Light Poles	395	
	Communication Antennas		
		:	
Second Parlie Frankting Int	The line Dealer		<b>C</b> D
Specialized Banking Furniture, Int.	Madular Control Contant		09
•	Modular Control Centers		
Sun Printing Co. of Marshamer Inc.	Executive Furniture		٨
Tenneco Dackaring	Compacted Shimping Contained		
Transt	Turbe Chargen M71-	25 20	110
TIUCASI	Turbo Charger wheels	29	

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#### 3. Needs and Goals

The City of Newberry is the economic center for the county. It is also a full service city providing police, fire, water, sewer, sanitation and electricity. By providing these services, the city is in a unique position to attract industries to areas around the city. It is adjacent to three I-26 interchanges (at Highways 219, 34 and 121) which have been identified for potential development in the I-26 Corridor Study. Also, the Newberry County Development Board has identified six sites for potential development near the City: (See the Economic Element map at the end of the chapter for the location of the sites.)

Name	Location		Acres
Parr Site	County Road 58		200
Wilson Site	U.S. 76		20
Newberry Industrial Park	Highway 219		185
Bush River Industrial Park	Highway 34		25 (remaining)
Baumgartner Site	Highway 76	138	
Carlton Site	Highway 121		144

The city has also recognized the importance of revitalizing the downtown area by creating a historic district, having a master plan developed, and encouraging the renovation of the Newberry Opera House. The downtown revitalization efforts have already had an impact by attracting new bed and breakfasts, restaurants, retail establishments, and offices. The first new apartment to open in years was rented before it was competed, and the city has already approved an ordinance which will aid in the creation of apartments on the second and third floors of the downtown buildings.

<u>Goal for the City of Newberry</u>: An economic element goal for the City of Newberry is to continue steps to improve the quality of life for its residents through its efforts in the downtown area but also by encouraging the development of the I-26 Interchanges and the sites identified by the Newberry County Development Board.

#### ECONOMIC ELEMENT MAP

# CHAPTER III NATURAL RESOURCES

#### 1. General

Located west of Fairfield and north of Lexington, Newberry County has approximately 414,477 acres in total land area. The land in Newberry is dissected by numerous streams and rivers that move in patterns characteristic of the topography, soil type, and geologic features of the area. Situated above the Fall Line, entirely within the Piedmont Plateau, the soils in Newberry County are hosts to farmlands and cultivated fields throughout the county. The most intense farming and forest harvesting is done west of the City of Newberry, where they are supported by streams, rivers and soils best suited for agricultural needs (U.S. Department of Agriculture, 1985). However, many of the same soils are equally suited for urban uses. Ultimately, these resources combine to provide a variety of plant and animal habitats.

#### 2. Inventory

#### 2.1 Climate

Climatic conditions in Newberry County are mild and temperate with rainfall fairly evenly distributed throughout the year. Generally, the west-to-east movements of pressure systems control daily weather patterns. However, during the summer, maritime tropical air persists for extended periods. Prevailing winds are northeasterly during the fall and southwesterly the rest of the year averaging seven miles per hour. The average 1:00 p.m. relative humidity is 51%. The average 1:00 a.m. relative humidity is 83%.

Newberry's summers are warm. The thermometer commonly reaches or exceeds the 90degree mark and occasionally such a reading will be observed in May, September, and October. Heavy to excessive rains and gusty winds, the effects of passing tropical storms, are sometimes experienced in July and August. Summer precipitation accounts for about 30 percent of annual rainfall, most of which occurs as thunderstorms.

In the fall, temperature extremes are practically nonexistent, rainfall is at a minimum, and consequently, sunshine is at a relative maximum. Autumn rainfall accounts for less than 20 percent of the annual total.

Winters are mild and relatively short with freezing temperatures recorded on about half the days. Snow and ice occur infrequently.

Mean annual temperature62.6 degreesMean annual precipitation45.22 inchesAverage length of growing season211 daysMean date of first fall freezeNovember 2Mean date of last spring freezeApril 5

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#### 2.2 Slope Characteristics

The slope of Newberry County is dependent upon location, soil type, and geologic formations that underlie the area. The highest elevations occur in the northwest and reach 780 feet above sea level. Lower elevations occur along rivers, streams, and along Parr Shoals Reservoir, which has a water surface elevation of around 260 feet. (Http://water.dnr.state.sc.us/hydro/owa/river.get\_data). The terrain is mostly gentle slopes with some steep slopes bordering streams and rivers (Central Midlands Regional Planning Council, 1983). A series of hills, including Little Mountain, runs along the southeastern boundary and rises 200 feet above the surrounding land (U.S. Department of Agriculture, 1960).

#### 2.3 Prime Agricultural and Forest Land

#### 2.3.1 General

Prime farmland is defined as land which is best suited for producing food, feed, forage, fiber, and oilseed crops (U.S. Department of Agriculture, 1985). In 1982, Newberry County had 130,216 acres of prime farmland, which was 31.4 percent of the total land area. Urbanization, which has been evidenced throughout the state, has generally led to the loss of agricultural land. The most recent data shows that of the total land area in Newberry County, 21.2 percent is used for agriculture. Most of the prime farmlands of Newberry County are below Sumter National Forest in the central and southern regions of the county. More dense concentrations also exist west of the City of Newberry. Scattered additional farmlands, which comprise 124,863 acres or 30.1 percent of the total land area, are mixed throughout the prime farmlands and reach into the northern part of the county along rivers and streams. The scattered additional farmlands are of statewide importance, but they exhibit some properties such as seasonal wetness, erodability, limiting root zone, flooding, or droughtiness, which exclude them from being considered prime farmlands depending on suitability and productivity, account for 68 percent of Newberry County land area. More recent data show that now, forest land, not including forested wetland, occurs in only 42 percent of the county.

See Table N-3 for crop suitability by soil type. In 1996 there were 540 farms in Newberry County accounting for 105,100 acres. The average farm was 195 acres. In addition to the crop production described above, the county ranked first in milk production in 1996 and second in egg production and livestock (Jan 1, 1997).

#### 2.4 Plant and Animal Habitats

It would seem that minimal surveying has been done in Newberry County by the NHP as only a few species are recorded. Crayfish are abundant on the Enoree and Little Rivers and their tributaries in the western region of the county. These invertebrate animals share habitats with the Kidney leaf mud-Revised November 12, 1998 93

plantain, which is found in mud or shallow waters. The bald eagle is the only endangered species identified in Newberry County (<u>A Guide to South Carolina's Endangered and Threatened Species</u>, Clemson Extension, July 1996). It has been surveyed along the border with Fairfield County, near the Broad River.

# 2.5 Water Resources and Wetlands

#### 2.5.1 General

The hydrologic regime of Newberry County is dominated by the Broad and Saluda River Sub-Basins, both of which are part of the larger Santee River Basin. Numerous streams cut throughout the county in leaf-like patterns to feed main river stems including the Broad, Saluda, and Enoree Rivers. Stream flow in the Piedmont Province is dependent on rainfall and storm water runoff. Because channels are not deeply incised in the terrain, there is less opportunity for them to intercept fracture zones that would support a groundwater baseflow (S.C. Water Resources Commission, 1983). All major rivers and creeks of Newberry County are classified as Freshwater (FW) (Department of Health and Environmental Control, 1993). These waters are suitable for swimming, fishing, and other contact recreation as well as a public water supply source after conventional treatment.

Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances for support, a prevalence of vegetation typically adapted for life in saturated soil conditions and generally include swamps, marshes, bogs, and similar areas (Comprehensive Plan, Fairfield County, Vismor and Associates, 1992, 39). Approximately 1.19 percent of Newberry County has hydric soils(soils characterized by an abundance of moisture) (USDA-NRCS MUIR database, Iowa State University Statlab). Table N-2 shows the breakdown of hydric soils. It should be noted that an update of the Newberry County Soil Survey is currently in progress.

# Table N-1 Newberry County Hydric Soils

Map unit symbol	Name	% Hydric	Total Area	Hydric Area
Mb	mixed alluvial land	100	4,160	4160
Се	Chewacla	5	1,908	95.40
Mc	mixed alluvial land	2	25,343	506.86
WcB	Worsham	5	3,356	167.80
		T :	otal acres	4930.06

Total acreage for Newberry County = 414,400 (According to Map Unit Interpretations Records database)

% hydric:

1.19

#### 2.5.2 Saluda River Basin

#### 2.5.2a Saluda River 03050109-080

The following information on the Saluda River Basin is from the <u>Watershed Water Quality</u> <u>Management Study: Saluda and Edisto Basin</u> Technical Report No. 003-95, published by the South Carolina Department of Health and Environmental Control, reprinted 10/97 without maps. For the purposes of this plan, only items directly related to Newberry County are included. For a complete discussion of the Saluda and Edisto basin, please consult the above referenced study.

#### **General Description**

Watershed number 03050109-080 extends through Anderson, Greenville, Abbeville, Laurens, Greenwood, and Newberry Counties and consists primarily of the Saluda River and its tributaries from Big Creek to the Lake Greenwood dam. The watershed occupies 176,703 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes series. The erodability of the soil (K) averages 0.25; the slope of the terrain averages 15%, with a range of 2-45%. Land use/land cover in the watershed includes: 2.68% urban land, 10.99% agricultural land, 21.70% scrub/shrub land, 0.55% barren land, 57.77% forested land, and 6.31% water.

There is a total of 294.8 stream miles in this watershed, all classified "Fresh Water" (FW). Toney Creek, Mountain Creek, Little Creek, and the Broadmouth Creek watershed (number 03050109-090) drain into the Saluda River in the upper portion of this watershed, and further downstream Turkey Creek (Goose Creek, Gypsy Creek, Gibson Creek, Dunns Creek, Little Turkey Creek) enters the river to form an arm of Lake Greenwood. Tributaries of the western side of Lake Greenwood include Mulberry Creek (Dudley Creek), Camp Branch, and Quarter Creek. The Reedy River watershed (number 03050109-120) and the Rabon Creek watershed (number 03050109-130) join to form another arm of the lake. Also flowing into the eastern lake shore are Long Lick Branch and Cane Creek. As a reach of the Saluda River, this watershed accepts the drainage of all streams entering the river upstream of the watershed. Another natural resource in this watershed is Greenwood State Park, which is located on the western shores of Lake Greenwood. Lake Greenwood is used for recreation, power generation, municipal purposes, and water supply.

#### Water Quality

Saluda River - Aquatic life uses are not supported in this section of the Saluda River due to methoxychlor (a pesticide) measured in excess of the acute aquatic life criterion in 1992. This is compounded by a significantly declining trend in dissolved oxygen concentration and a significantly increasing trend in turbidity, most likely the result of nonpoint source runoff. Dibromochloromethane (a trihalomethane) was detected in water in 1988. Recreational uses are fully supported.

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Lake Greenwood - Lake Greenwood is categorized as a major lake and has a watershed covering 772.1 square miles. The lake has a surface area of 11,400.5 acres, with a maximum depth of 68.9 feet and mean depth of 23 feet. There are four SCDHEC monitoring sites along Lake Greenwood and aquatic life and recreational uses are fully supported at all four sites. Excursions of pH occurred in the Reedy River arm (monitor S-022), the main body of the lake (monitor S-131), and near the dam (monitor S-303); however, higher levels occur naturally in lakes with significant phytoplankton communities and are considered natural conditions, not standards violations. Notable trends in the lake include a significantly declining trend in dissolved oxygen concentration in the Reedy River arm, and a significantly declining trend in pH in the main lake body, both warranting continued observation.

The lake has been treated with aquatic herbicides from 1989-91 and 1993-94 by the Water Resources Division of the SCDNR in an effort to control the aquatic macrophytes. A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrient in the lake system was nitrogen. Eutrophication studies classify the headwaters of Lake Greenwood as Category II for intermediate trophic condition, which could be susceptible to further degradation. The darn area is classified as Category III and is recommended for preservation. The water quality trend data from 1980-1990 indicates that the headwaters and the dam area have improving conditions. The headwaters improved from Category I to Category II and the dam area improved from Category II to Category III. The Reedy River arm of the lake is classified as Category I due to its high nutrient load. Phosphorus removal from point sources has been implemented, but further watershed management is recommended to further reduce the nutrient load.

#### **Point Source Contributions**

This section of the Saluda River is included on the  $\S303(d)^1$  high priority list of waters targeted for TMDL<sup>2</sup> development in relation to toxics present in the stream. The Saluda River is also included on the  $\S304(1)^3$  long list of impacted waterbodies due to concerns for non- $\$307(a)^4$  toxic pollutants.

#### Nonpoint Source (NPS) Contributions

Refers to section 303(d) of the Clear Water Act.

<sup>2</sup> Total Maximum Daily Load is the calculated maximum allowable pollutant loading to a waterbody at which the water quality standards are maintained.

<sup>3</sup> Refers to section 304(I) of the Clean Water Act.

Refers to section of the 307 (a) of the Clean Water Act.

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The Saluda River and Lake Greenwood are both included on the §319 list of waters impacted by agricultural activities, and computer modeling indicates a high potential for NPS problems from agricultural activities for both areas. Water samples collected from the Saluda River by the SCDHEC and data received from outside agencies indicate elevated levels of toxic materials (pesticides), suspended solids, and turbidity on numerous occasions. Lake Greenwood is included on the §319<sup>5</sup> list of waters targeted for further evaluation and on the §304(I) long list for waters impacted by nontoxic pollutants. Samples taken by SCDHEC personnel indicate elevated nutrient levels on numerous occasions, together with scattered pH and dissolved oxygen excursions. Cane Creek is being added to the §319 list due to scattered dissolved oxygen excursions and sedimentation of the stream, which may adversely impact the macroinvertebrate community.

#### **Growth Potential**

Lake Greenwood has experienced significant growth; however, the growth is expected to continue at a slower pace in the future. U.S. Highway 221 and a major rail line cross this watershed. A major sewer interceptor connecting Honea Path with Ware Shoals is nearing completion, and will spur growth in the area.

#### 2.5.2b Little River 03050109-103

#### **General Description**

Watershed number 03050109-163 is located in Laurens and Newberry Counties and consists primarily of the Little River and its tributaries from the Laurens-Newberry County line to its confluence with the Saluda River. The watershed occupies 71,751 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Pacolet-Hemdon-Cecil-Wilkes series. The erodability of the soil (K) averages 0.28; the slope of the terrain averages 15%, with a range of 240%. Land use/land cover in the watershed includes: 0.75% urban land, 19.33% agricultural land 17.46% scrub/shrub land, 0.16% barren land, 62.12% forested land, and 0. 18% water.

The section of the Little River in this watershed receives drainage from the upper Little River watershed (03050109-160), and together with its tributaries drains into the Saluda River near the Town of Silverstreet. Garrison Creek flows into the Little River near the top of the watershed. Further downstream, the Little River accepts drainage from Sandy Run Creek (Reeder Branch), Mechanic Creek, Mudlick Creek (Campbell Creek, North Campbell Creek, Mill Creek, Watkins Creek, Mills Creek, Pages Creek), Davenport Branch, and Stephens Creek. (Note: Creeks in bold are located in Newberry County). There is a total of 84.7 stream miles in this watershed, all classified "Fresh Water" (FW).

<sup>5</sup> Refers to section 319 of the 1987 amendment to the Clean Water Act. Revised November 12, 1998 97

#### Water Quality

Little River - There are two SCDHEC monitoring sites along this section of the Little River. Aquatic life uses are fully supported at both sites. Significantly increasing trends in pH and turbidity were noted at the upstream site, most likely due to nonpoint source runoff. Recreational uses are not supported at the upstream site due to fecal coliform bacteria excursions under Class FW (Fresh Water) standards. Recreational life uses are considered to be fully supported at the downstream site, despite fecal coliform bacteria excursions, since they only occurred in a small number of samples.

**Point Source Contributions** 

There are currently no point source dischargers in this watershed.

#### Nonpoint Source (NPS) Contributions

This section of the Little River is included on the §303(d)<sup>6</sup> high priority list of waters targeted for TMDL development in relation to elevated fecal coliform concentrations. The Little River is listed as waters impacted by agricultural activities, and computer modeling indicates a high potential for NPS problems from agricultural activities. Water samples collected by the SCDHEC indicate elevated levels of fecal coliform and turbidity on numerous occasions, together with scattered pH excursions. The Little River is also included on the §304(I) long list for waters impacted by nontoxic pollutants.

Mining Activities

MINING COMPANY MINE NAME

CAROLINA VERMICULITE COMPANY, INC. KENNETH HANNA MINE

NEWBERRY COUNTY FRANK SENN MINE

SOUTHERN BRICK COMPANY SPIGNER MINE PERMIT # MINERAL

0642-30 VERMICULITE

0600-36 SAND/CLAY

0828-36 CLAY

**Growth Potential** 

There is a low potential for growth in this rural watershed.

# <sup>6</sup> Refers to section 303(d) of the Clean Water Act. Revised November 12, 1998 98

#### 2.5.2c Saluda River 03050109-150

#### **General Description**

Watershed 03050109-150 is located in Laurens, Newberry, Saluda, and Greenwood Counties and consists primarily of the Saluda River and its tributaries from the Lake Greenwood dam to the Lake Murray headwaters. The watershed occupies 168,299 acres of the Piedmont region of South Carolina. The predominant soil consist of an association of the Cecil-Pacolet-Wilkes-Herndon series. The erodability of the soil (K) averages 0.28; the slope of the terrain averages 15%, with a range of 2-45%. Land use/land cover in the watershed includes: 5.37% urban land, 22.97% agricultural land, 8.53% scrub/shrub land, 0.08% barren land, 61.37% forested land, 0.03% forested wetland (swamp), and 1.66% water.

This section of the Saluda River flows out of Lake Greenwood and is joined by Halfway Swamp (Thompsons Creek) and Sharps Branch near the former Town of Chappells. Further downstream, Terrapin Creek and Mill Creek enter the river, followed by the Little River watershed (number 03050109163), Rocky Branch, and Tosity Creek. Beaverdam Creek (Welch Creek) flows past the Town of Silverstreet and drains into the Saluda River arm of Lake Murray.

The Bush River originates near the City of Clinton where it accepts drainage from Shell Creek (Sand Creek). Further downstream, near the City of Newberry, Rocky Creek, Big Beaverdam Creek (Reedy Creek), and Scott Creek flow into the Bush River. The Bush River then accepts drainage from Timothy Creek (Kinards Creek, Dewalt Creek) near the Town of Prosperity and drains into the Saluda River arm of the lake. Big Creek enters the lake just downstream of the confluence of the Saluda and Bush Rivers. Several small lakes exist in the watershed for recreational and/or irrigational purposes. (Note: Creeks in bold are in Newberry County.) There is a total of 208.3 stream miles in this watershed, all classified FW. As a reach of the Saluda River, this watershed accepts the drainage of all streams entering the river upstream of the watershed.

#### Water Quality

Saluda River - There are three SCDHEC monitoring sites along this section of the Saluda River, and recreational uses are fully supported at all sites. Aquatic life uses are only partially supported at the upstream site due to dissolved oxygen excursions. This was compounded by a high concentration of copper measured in 1989 and a significantly decreasing trend in pH. Aquatic life uses are only partially supported at the midstream site due to dissolved oxygen excursions; however, a significantly increasing trend in dissolved oxygen concentration and a significantly declining trend in BOD, suggest improving conditions. A high concentration of copper was measured in 1989 at this site. Aquatic life uses are fully supported at the downstream site, although a high concentration of zinc was measured in 1992.

Saluda River Arm of Lake Murray - A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrient in Lake Murray was nitrogen. Eutrophication Revised November 12, 1998 99

studies classify the Saluda River ann of the lake as Category I for excessive nutrients and extremely high productivity. Continued watershed management and in-lake restoration techniques for algae and macrophytes are recommended. Although pH excursions occurred, elevated pH levels occur naturally in lakes with significant phytoplankton communities. Due to natural conditions and to the small number of samples, aquatic life uses are considered to be fully supported at all sites. Recreational uses are also fully supported.

Bush River - There are three SCDHEC monitoring sites along the Bush River, which was Class B until April 1992. Bacterial conditions are expected to continue to improve as new NPDES permit limits are instituted in the watershed. Aquatic life uses are fully supported at the upstream site, but may be threatened by a significantly declining trend in dissolved oxygen concentration and a significantly increasing trend in total nitrogen. Recreational uses are not supported at this site due to fecal coliform bacteria excursions under Class FW standards; however, a significantly declining trend in fecal coliform bacteria concentrations suggests improving conditions. Aquatic life uses are fully supported at the midstream and downstream sites, although a significantly increasing trend in pH was noted at the downstream site. Recreational uses are not supported at either the midstream or downstream sites due to fecal coliform bacteria excursions under Class FW standards.

Scott Creek - Aquatic life uses are fully supported, but may be threatened by a significantly declining trend in dissolved oxygen concentration. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards.

Bush River Arm of Lake Murray - A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrient in Lake Murray was nitrogen. Eutrophication studies classify the Bush River arm of the lake as Category I for excessive nutrients and extremely high productivity. High algal concentrations may impair swimming usage of the Bush River arm of the lake. Continued watershed management and in lake restoration techniques for algae and macrophytes are recommended.

There are two SCDHEC monitoring sites in this portion of the lake, and recreational uses are fully supported at both sites. Although pH excursions occurred, elevated pH levels occur naturally in lakes with significant phytoplankton communities. Due to the small number of samples at the upstream site, aquatic life uses are considered to be fully supported. Aquatic life uses may be threatened at the downstream site due to a high concentration of zinc measured in 1990 and a very high concentration of zinc measured in 1991. Derivatives of DDT (P,P'DDT and P,P'DDE) were detected in sediment in 1988. Although the use of DDT was banned in 1973, it is very persistent in the environment. A significantly increasing trend in pH was also noted.

#### Water Supply

WATER USER (TYPE)	STREAM	AMOUNT WITHDRAWN (MGD)
CITY OF NEWBERRY (M)	SALUDA RIVER	3.36
Revised November 12 1998	100	

#### **Point Source Contributions**

The Bush River arm of Lake Murray is included on the §303(d) low priority list of waters which may require TMDL development due to elevated nutrient levels. Ile Saluda River and Dewalt Creek are included on the §304(I) long list of impacted waterbodies due to concerns for non-§307(a) toxic pollutants, and the Bush River is on the §304(I) long list due to concerns for nontoxic pollutants.

RECEIVING STREAM FACILITY NAME PERMITTED FLOW @ PIPE (MGD) COMMENT NPDES# TYPE LIMITATION (EF/WQ)

SC0022730

EFFLUENT

SC0024490

SALUDA RIVER CHAMPION INTL. CORP. PIPE#: 001 FLOW: 0.239 PROPOSED TEMPORARY DISCHARGE

#### BUSH RIVER

CITY OF NEWBERRY/BUSH RIVER PLANT PIPE#: 001 FLOW: 3.220 WQL FOR NH3-N, DO, TRC, BOD5 SC0024490 MAJOR MUNICIPAL WATER QUALITY

MINOR INDUSTRIAL

BUSH RIVER CITY OF NEWBERRY/BUSH RIVER PLANT PIPE#: 001 FLOW: 4.90 PROPOSED; WQL FOR NH3-N, DO, TRC, BOD5

WATER QUALITY SC0040860

MINOR MUNICIPAL

WATER QUALITY

MAJOR MUNICIPAL

BUSH RIVER NEWBERRY COUNTY W&S PLT #1 PIPE#: 001 FLOW: 0-5 WQL FOR NH3-N, DO, TRC, BOD5

BUSH RIVER TRIB FEDERAL PAPER BOARD PIPE#: 001 FLOW: 0.019 ONCE THROUGH NON-CONTACT COOLING WATER

SCO036064 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source (NPS) Contributions Revised November 12, 1998 101 The Saluda River and the Bush River are both included on the §319 list of waters impacted by agricultural activities; computer modeling indicates a high potential for NPS problems from agricultural activities for both of these streams. Water samples collected from the Saluda River by SCDHEC personnel indicate scattered elevated levels of toxic materials (metals). Data received from outside agencies and water samples collected by the SCDHEC from the Bush River indicate elevated levels of total nitrogen on numerous occasions, and scattered dissolved oxygen excursions.

Scott Creek is included on the §319 list of waters impacted by urban runoff. Water samples collected by the SCDHEC indicate elevated fecal coliform levels on numerous occasions, and scattered DO excursions. Scott Creek is also included on the §303(d) high priority list of waters targeted for TMDL development in relation to elevated fecal coliform concentrations. Scott Creek is included on the §3040(I) long list for waters impacted by nontoxic pollutants.

CLOSED

Landfill Activities

SOLID WASTE LANDFILL NAMEPERMITFACILITY TYPESTATUSNEWBERRY CITY LANDFILLDWP-M

DOMESTIC

**Mining Activities** 

None identified in Newberry County.

**Growth Potential** 

U.S. Highway 76 and a rail line run along the eastern watershed border from the Town of Prosperity to the City of Clinton, including the City of Newberry. The only area in this predominately rural watershed with sewer and water services is the City of Newberry, which discharges its wastewater into the Bush River. Assimilative capacity of the Bush River is limited and may affect the growth in this region. Another future growth area predicted for the watershed, in terms of residential growth, is the Saluda Arm of Lake Murray.

2.5.2d Saluda River 03050109-190

**General Description** 

Watershed number 03050109-190 is located in Newberry, Saluda, Lexington, and Richland Counties and consists primarily of the Saluda River and its tributaries from the Lake Murray headwaters to the dam. The watershed occupies 160,460 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Tatum-Georgeville-Herndon-Revised November 12, 1998 102 Lakeland series. The erodability of the soil (K) averages 0.28; the slope of the terrain averages 7%, with a range of 225%. Land use/land cover in the watershed includes: 3.49% urban land, 13.20% agricultural land, 1.27% scrub/shrub land, 0.12% barren land, 53.52% forested land, 0.01% forested wetland (swamp), and 28.39% water.

The Saluda River watershed (number 03050109-150) and the Little Saluda River watershed (number 03050109-170) merge to form the headwaters of Lake Murray. Spring Creek, Hawleek Creek, Rocky Creek (Whetstone Creek), and Buffalo Creek flow into the waters of upper Lake Murray. Camping Creek (Susannah Branch, Snap Branch), Stevens Creek (Millers Branch), and Bear Creek (Rocky Branch, Stinking Creek) enter midlake on the northern shore, and the Hollow Creek watershed (number 03050109-200), Horse Creek (Little Horse Creek), Little Hollow Creek, Beaverdam Creek, Rocky Creek (Clemons Branch), Beech Creek, and Twentymile Creek enter midlake on the southern shore of the lake. Eighteenmile Creek drains into the lake near the dam. Lake Murray is owned and operated by SCE&G Company and is used for power production, recreation, and water supply. There are also several small ponds (10-18 acres) in the watershed used for recreation. Billy Dreher State Park, located midlake on Billy Dreher Island is another natural resource in the watershed. (Note: Creeks in bold are in Newberry County). There is a total of 82.6 stream miles (tributaries) in this watershed, and Lake Murray extends over 51,000 acres.

#### Water Quality

Lake Murray - Categorized as a major lake, Lake Murray has a watershed covering 1,181.3 square miles and a surface area of 51,002 acres. The lake undergoes thermal stratification during the summer months, and has maximum and mean depths of 189.6 feet and 41.3 feet, respectively. A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrient in the lake system was nitrogen. Eutrophication studies reclassified the lake headwaters from Category I to Category II, for an intermediate trophic condition, which may be susceptible to further degradation. The dam area is classified as a Category III for the lowest trophic condition and is recommended for preservation. Treatment for *Hydrilla* in selected areas of Lake Murray began in 1993 by the Water Resources Division of the SCDNR to provide public access in the following areas: the public ramp at the dam, the SCE&G beach at the dam, Snelgrove's Landing, Putnam's Landing, Shull Island Ramps A and B, Turner's Landing, The Village Cove, and Pine Island. A total of 84 acres were treated in the midlake and lower lake areas. Herbicide treatment in selected areas of Lake Murray for *Hydrilla* was continued in 1994.

There are eight SCDHEC monitoring sites within the main body of Lake Murray, three of which are adjacent to Newberry County: a cove west of Billy Dreher Island (monitor S-212), the Camping Creek Arm of Lake Murray (monitor S-213), and an open station offshore of Billy Dreher Island (monitor S-280). Excursions of pH occurred at most of the eight sites; however, higher pH levels occur naturally in lakes with significant phytoplankton communities and do not represent standards violations. Aquatic life uses are fully supported in the Rocky Creek arm (monitor S-279), although significantly increasing trends in BOD, and pH were noted. A high concentration of zinc was measured at this site in 1991, and a derivative of DDT (P,P'DDE) was detected in sediment in 1992. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are fully Revised November 12, 1998 103

supported at this site, but a significantly increasing trend in fecal coliform bacteria concentrations warrants attention. Aquatic life and recreational uses are fully supported in the Buffalo Creek arm (monitor S-211), a cove west of Billy Dreher Island (monitor S-212), and the Camping Creek arm (monitor S-213). A significantly increasing trend in pH was noted at both a cove west of Billy Dreher Island (monitor S-212) and the Camping Creek arm (monitor S-212) and the Camping Creek arm (monitor S-213). Recreational uses are fully supported at the open water station offshore of Billy Dreher Island (monitor S-280), the open water site near the dam (monitor S-273), the cove near Susie Ebert Island (monitor S-274), and at the dam (monitor S-204), but significantly increasing trends in fecal coliform bacteria concentrations at all four sites warrant attention. Significantly increasing trends in pH were also noted at all four sites.

Aquatic life uses are fully supported at offshore of Billy Dreher Island (S-280); however, a high concentration of chromium was measured in 1988 sediment samples and a very high concentration of chromium was measured in 1990. Aquatic life uses are also fully supported at the open water site near the darn (monitor S-273), although a high concentration of zinc was measured in water in 1989, and a high concentration of chromium was measured in sediment in 1992. Aquatic life uses are fully supported at the cove near Susie Ebert Island (monitor S-274); however, a high concentration of zinc was measured in 1992, and sediment samples revealed a derivative of DDT in 1992 and a very high concentration of mercury in 1989. Aquatic life uses may be threatened at the darn (monitor S-204) due to the high concentrations of zinc measured in 1988 and 1989. Derivatives of DDT (P,P'DDD and P,P'DDE) were detected in sediment in 1988, together with a high concentration of chromium detected in 1988 and a very high concentration of chromium in 1990.

Camping Creek - Aquatic life uses are fully supported, however a significantly increasing trend in pH was noted. Recreational uses are not supported due to fecal coliform bacteria excursions. This stream was Class B until April, 1992, and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed.

Sanitary Bathing Areas

RECREATIONAL STREAM BATHING SITE PERMIT # STATUS

LAKE MURRAY DREHER ISLAND STATE PARK 36-NO7 ACTIVE

Water Supply

None identified in Newberry County.

**Point Source Contributions** 

Camping Creek is included on the Section 303(d) low priority list of waters which may require TMDL development in relation to fecal coliform, traces of toxic materials, potential ammonia toxicity,

and dissolved oxygen concerns. Camping Creek is also included on the §304(1) long list of impacted waterbodies due to concerns for nontoxic pollutants.

RECEIVING STREAM FACILITY NAME PERMITTED FLOW @ PIPE (MGD) COMMENT

LAKE MURRAY SCDPRT/DREHER ISLAND PIPE#: 001 FLOW: 0.06 WQL FOR NH3-N, DO, BOD5

LAKE MURRAY TRIB ROLLINGWOOD SD/CAROLINA WATER PIPE #: 001 FLOW: 0.044 WQL FOR NH3-N, DO, TRC, BOD5

CAMPING CREEK GA PACIFIC/PROSPERITY PIPE#: 001 FLOW: -BOILER BLOWDOWN, SOFTENER BACKWASH

CAMPING CREEK NEWBERRY COUNTY/PLANT 2 PIPE#: 001 FLOW: 0.03 WQL FOR NH3-N, DO, TRC, BOD5

STEVENS CREEK MR-DERA GARDEN APTS PIPE#: 001 FLOW: 0.0144 WQL FOR NH3-N, DO, TRC

LAND APPLICATION FACILITY NAME

SPRAY IRRIGATION BEDFORD WAY/NCW&SA

Revised November 12, 1998

NPDSE# TYPE LIMITATION (EF/WQ)

SC0026948 MINOR COMMUNITY WATER QUALITY

SC0022845 MINOR COMMUNITY WATER QUALITY

> SC0022641 MINOR INDUSTRIAL EFFLUENT

SC0044741 MINOR MUNICIPAL WATER QUALITY

SC0032042 MINOR COMMUNITY WATER QUALITY

PERMIT # TYPE

ND0062219 MINOR MUNICIPAL

#### Nonpoint Source (NPS) Contributions

The Lake Murray headwaters and Camping Creek are both included on the §319 list of waters impacted by agricultural activities, and both are included on the §304(l) long list for waters impacted by nontoxic pollutants. Data received from outside agencies and water samples collected by the SCDHEC from the headwaters of Lake Murray indicate numerous dissolved oxygen excursions, and scattered elevated levels of fecal coliform and toxic materials (metals). There are also scattered excursions of pH and BOD<sub>5</sub> Computer modeling indicates a high potential for NPS problems from agricultural activities for the headwaters area.

Water samples collected by the SCDHEC from Camping Creek indicate elevated levels of fecal coliform on numerous occasions. Camping Creek is also included on the §319 list of watersheds targeted for Implementation Action (the ongoing project is described below).

#### **Camping Creek Watershed Study**

A comprehensive watershed project funded under §319 is currently underway involving Camping Creek. The objective of the project is to encourage farmers in the watershed to implement "best management practices" on row-crop land and on land used for intensive livestock operations. Components of the project include technology transfer, innovative BMP demonstrations, education, and effectiveness monitoring.

#### **Mining Activities**

None identified in Newberry County.

#### **Growth Potential**

The area surrounding Lake Murray is developing at a rapid pace. The widening of U.S. Highway 378 to four lanes will increase the expansion rate along the Lexington side of the lake. U.S. Highway 76 runs along the opposite shoreline of the lake, as does a rail line. The widening of I-26 toward the Chapin/Pomaria Exit is encouraging growth on both sides of the interstate.

Residential development continues to grow within the lake region. The area around the dam is the most developed and has water and sewer. The Richland County portion of the lake is also well developed and has several residential subdivisions where water and sewer are available, and is continuing to develop. Extension of sewer along the northern shoreline is likely in the next five to ten years. The area surrounding the Town of Chapin is moderately developed with residential subdivisions that include Kensington Plantation and golf course. The City of Columbia has recently extended water to serve the Town of Chapin and has made water available to Kensington Plantation and other subdivisions in the area. Several small privately and publicly owned sewer systems serving separate residential areas need to be tied together.

The upper lake region in Newberry County is primarily rural: a few small subdivisions, some industry, and agricultural activities on a small scale. The Town of Prosperity has community water and Revised November 12, 1998 106

sewer service provided by Newberry County Water and Sewer Authority, which allows slow but steady growth in the area. A water treatment plant is proposed to draw water from this upper region of Lake Murray, and sewer service is to be expanded beyond Plantation Pointe. The industries in the region provide their own wastewater treatment. The expanded water services and access to the interstate should encourage growth in this area.

The Lexington County side (southern shoreline) of the lake is rural with patches of residential and commercial development. Agricultural activities in the upper lake region, primarily livestock and orchards, constitute a large portion of the landuse. Extension of water up U.S. Highway 378 from the City of West Columbia/Lexington County's 6.0 million gallon water plant is currently in the discussion stage. The plant is located on Lake Murray and takes raw water from the lake. A sewer force main has recently been built along Highway 378 from the Town of Saluda's traffic circle to the Town of Lexington. A special tax district to cover the expense of further sewer installation around the lake shoreline is being discussed.

Lake Murray, as the main water-based recreational resource in the region, draws millions of visitors annually to its numerous parks, recreational areas, and waterways. All aspects of growth surrounding Lake Murray (tourist industry, residential development, agricultural activities) are expected to continue.

#### 2.5.2e Stream Flow Data

The following stream flow data is from the U.S. Geological Survey Water-Data Report SC-96-1.

2.226 cfs

#### Saluda River at Chappells

Water year 1996 annual Mean Water years 1927-1996 Annual Mean Water years 1927-1996 Highest Annual Mean Water years 1927-1996 Lowest Annual Mean Water year 1996 Highest Daily Mean Water year 1927-1996 Highest Daily Mean Water year 1927-1996 Highest Daily Mean

1,913 cfs 3,110 cfs 732 cfs 15,500 cfs (February 4) 156 cfs (July 2) 56,700 cfs (October 3, 1929) 8 cfs (October 29, 1939

#### Lake Greenwood Near Chappells

Extremes since 1940 (Minimum Gauge height since normal reservoir levels first reached)Maximum Elevation442.02 ft. (March 5, 1952)Minimum Elevation424.42 ft. (October 16, 1947)

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Extremes for water year 1996 Maximum Elevation Minimum Elevation

439.95 ft. (March 7, 1996) 434.78 ft. (January 26, 1995)

#### Little River near Silverstreet

Water year 1996 annual Mean	243 cfs
Water years 1990-1996 Annual Mean	228 cfs
Water years 1990-1996 Highest Annual Mean	304 cfs (1993)
Water years 1990-1996 Lowest Annual Mean	102 cfs (1992)
Water year 1996 Highest Daily Mean	5,600 cfs (February 3)
Water year 1996 Lowest Daily Mean	43 cfs (July 12)
Water year 1990-1996 Highest Daily Mean	5,600 cfs (February 3, 1996)
Water year 1990-1996 Lowest Daily Mean	11 cfs (August 21, 1990)

#### Lake Murray near Columbia

Extremes since 1929 (Minimum	gauge height since generation of power was started)
Maximum Elevation	361.51 (April 10, 1936)
Minimum Elevation	320.92 ft. (December 23, 1941)

Extremes for water year 1996 Maximum Elevation Minimum Elevation

358.21 (May 2, 1996) 344.97 (September 30, 1996)

#### Bush River near Prosperity

123 cfs
128 cfs
178 cfs (1993)
60.9 cfs (1992)
2,500 cfs (February 3)
18 cfs (August 21-24)
4,330 cfs (January 25, 1995)
12 cfs (September 13, 1993)

#### 2.5.3 Broad River Basin

The following information on the Broad River Basin is from the draft <u>Watershed Quality</u> <u>Management Strategy: Broad River Basin</u> Technical Report 001-98, drafted by the South Carolina Department of Health and Environmental Control, 1998. For the purposes of this plan, only items directly related to Newberry County are included. For a complete discussion of the Broad River basin, please consult the above referenced study.

2.5.3a Duncan Creek	03050108-040
Revised November 12, 1998	108

#### General Description

Watershed number 03050108-040 is located in Laurens and Newberry Counties and consists primarily of **Duncan Creek** and its tributaries. The watershed occupies 92,409 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes-Madison-Pacolet series. The erodability of the soil (K) averages 0.26; the slope of the terrain averages 16%, with a range of 2-45%. Land use/land cover in the watershed includes: 4.57% urban land, 7.62% agricultural land, 5.90% scrub/shrub land, 0.63% barren land, 81.02% forested land, and 0.26% water.

Duncan Creek originates near the Town of Ora and accepts drainage from Duncan Creek Reservoir 6B (73 acres), Long Branch, Saxton Branch, Beards Fork Creek, Millers Fork (Sand Creek), and Allisons Branch. Beards Fork Creek and Millers Fork enter Duncan Creek near the City of Clinton. Further downstream near the Town of Whitmire, South Fork Duncan Creek (Ned Wesson Branch) enters Duncan Creek, followed by Mulberry Branch and Sandy Branch. There are several ponds and lakes (11-73 acres) in this watershed used for recreational, municipal, and flood control purposes and a total of 142.5 stream miles, all classified "Fresh Water" (FW). (Note: Creeks in bold are in Newberry County). The lower portion of the watershed resides within the Sumter National Forest.

#### Water Quality

Duncan Creek (B-072) - Aquatic life uses are fully supported based on macroinvertebrate community data, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and by occurrences of zinc in excess of the aquatic life acute standard, including a very high concentration measured in 1995. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

#### Activities Potentially Affecting Water Quality

#### **Point Source Contributions**

RECEIVING STREAM FACILITY NAME PERMI7TED FLOW @ PIPE (MGD) COMMENT

DUNCAN CREEK TOWN OF WHITMIRE PIPE #: 001 FLOW: 0.6 PIPE #: 001 FLOW: 1.0 (PROPOSED) WQL FOR TRC

DUNCAN CREEK Revised November 12, 1998 NPDES# TYPE LIMITATION

SCO022390 MINOR MUNICIPAL WATER QUALITY WATER QUALITY

#### SCG250014

# ALAMAC KNIT FABRICS INC. PIPE #: 001 FLOW: M/R

#### MINOR INDUSTRIAL EFFLUENT

Nonpoint Source (NPS) Contributions

Duncan Creek is listed on the 1996 §303(d) tertiary list due to concerns for fecal coliform bacteria.

Landfill Activities

None identified in Newberry County. Mining Activities

None identified in Newberry County.

Water Supply

WATER USER (7TPE) STREAM

# PUMPING CAPACITY (MGD) REG. PUMPING CAPACITY (MGD)

TOWN OF WHITMIRE (M) DUNCAN CREEK

1.0 1.0

**Growth Potential** 

There is a high potential for industrial growth in this watershed, which contains the City of Clinton and the intersection of 1-26 and 1-385. Future industrial development will be prevalent along 1-385 to the area south of Clinton. US 221 crosses the watershed connecting the Cities of Laurens and Spartanburg, and US 276 connects the Cities of Clinton and Greenville.

#### **Implementation Strategy**

Duncan Creek is impaired from elevated levels of fecal coliform bacteria resulting from both point and nonpoint sources. Pennit revisions have been initiated and bacterial improvements are expected in the next basin rotation. The SCDHEC's Watershed Implementation staff will work with agriculture specialists from the SCDHEC and NRCS to determine, if possible, the origin of the nonpoint source related bacteria.

2.5.3b Enoree River 03050108-050

#### **General Description**

Watershed number 03050108-050 is located in Newberry and Laurens Counties and consists primarily of the Enoree River and its tributaries from Duncan Creek to its confluence with the Broad River. Revised November 12, 1998 110 The watershed occupies 119,020 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet-Wilkes series. The erodability of the soil (K) averages 0.25; the slope of the terrain averages 13%, with a range of 2-40%. Land use/land cover in the watershed includes: 1.03% urban land, 5.87% agricultural land, 2.42% scrub/shrub land, 0.18% barren land, 90.44% forested land, and 0.07% water.

This segment of the Enoree River accepts drainage from the upstream reaches (numbers 03050108-010, 03050108-030) together with Sulphur Spring Branch, Collins Branch, and Indian Creek. Indian Creek originates near the Town of Joanna and accepts drainage from Fort Branch, Loftons Branch, Locust Branch, Long Branch (Buncombe Branch), Headleys Creek (Peges Creek), Pattersons Creek, Asias Branch, Gilders Creek (Johns Mountain Branch, Joshuas Branch), and Hunting Creek. South Fork Kings Creek (Little Kings Creek, Means Branch) enters the river near the City of Newberry, followed by Fosters Branch, Quarters Branch, and Subers Creek. (Note: Creeks in bold are in Newberry County.) There are 175.0 stream miles in this watershed, all classified "Fresh Water" (FW). The entire watershed resides within the Sumter National Forest and the Enoree River Waterfowl Area is located near the confluence with the Broad River.

#### Water Quality

Enoree River (B-054) - Aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in total suspended solids. Sediment samples revealed dinbutylphthalate in 1995. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal colliform bacteria excursions.

Indian Creek (B-071) - Aquatic life uses are fully supported based on macroinvertebrate community data.

#### Activities Potentially Affecting Water Quality

**Point Source Contributions** 

RECEIVING STREAM FACILITY NAME PERMITTED FLOW @ PIPE (MGD) COMMENT NPDES# TYPE LIMITATION

HEADLEYS CREEK JOANNA KOA PIPE #: 001 FLOW: 0.010 WQL FOR BOD5,DO,TRC,NH3N SCO024732 MINOR COMMUNITY WATER QUALITY

# Nonpoint Source (NPS) Contributions Revised November 12, 1998

This section of the Enoree River is included on the §319 high priority list of the Nonpoint Source Management Program and the 1996 §303(d) tertiary list due to concerns for fecal coliform bacteria.

#### **Growth Potential**

There is a low potential for growth in this watershed, with the exception of the City of Woodruff. Woodruff is expected to experience industrial, commercial, and residential growth. The remainder of the watershed is effectively excluded from development by residing in the Sumter National Forest.

#### Implementation Strategy

The Enoree River is impaired by elevated levels of fecal coliform bacteria resulting from nonpoint sources. The SCDHEC's Watershed Implementation staff will work with agriculture specialists from the SCDHEC and NRCS to determine, if possible, the origin of the bacteria.

#### 2.5.3c Broad River 03050106-050

#### **General Description**

Watershed number 03050106-050 is located in Newberry and Fairfield Counties and consists primarily of the Broad River and its tributaries from the Tyger River to the Parr Shoals dam. The watershed occupies 156,544 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet-Wilkes series. The erodability of the soil (K) averages 0.24; the slope of the terrain averages 15%, with a range of 2-40%. Land use/land cover in the watershed includes: 0.73 % urban land, 11.17 % agricultural land, 3.86 % scrub/shrub land, 0.34 % barren land, 76.86% forested land, and 7.03% water.

This section of the Broad River accepts drainage from its upper reaches (watershed numbers 03050105-094, 03050106-010) together with the Tyger River Watershed, the Enoree River Watershed, Beaver Creek (McClures Creek, Chicken Creek, Storm Branch, Reedy Branch, Sandy Fork), Rocky Creek, and Terrible Creek. The Parr Shoals dam impounds the Broad River to form Parr Reservoir, which accepts drainage from Hellers Creek (Second Creek, Buck Branch) and Cannons Creek (Rocky Branch, Kerr Creek, Charles Creek, Mud Creek). Monticello Reservoir (7100 acres) is connected to Parr Reservoir by Frees Creek. There are a few ponds and lakes (10-7100 acres) in this watershed used for recreation, industry, and power supply. (Note: Creeks in bold are in Newberry County). There is a total of 294.9 stream miles, all classified FW. The Sumter National Forest and the Broad River Waterfowl Area are natural resources in the watershed.

Water Quality

A fish consumption advisory has been issued by the SCDHEC for mercury and includes portions of the Broad River in this watershed (see Watershed Evaluations and Implementation Strategies Within Watershed Management Unit-0502).

Broad River (B-047) - Aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in total phosphorus concentration. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are partially supported due to fecal coliform bacteria excursions. This river was Class B until April 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Beaver Creek (B-143) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Cannons Creek (B-751) - Aquatic life uses are fully supported based on macroinvertebrate community data.

*Parr Reservoir* - Parr Reservoir is a 4,400-acre impoundment on the Broad River in Fairfield and Newberry Counties, linked with Monticello Reservoir via a pumped storage hydroelectric facility. Parr Reservoir's maximum depth is approximately 25 feet and the average depth is 15 feet. The reservoir's watershed comprises approximately 4,750 square miles in North and South Carolina. Currently, Parr Reservoir maintains an intermediate trophic condition among large lakes in South Carolina; a short retention time (average approximately four days) results in both high dissolved oxygen concentrations and high turbidity.

There are two monitoring sites along Parr Reservoir. Aquatic life and recreational uses are fully supported at both the uplake site (monitor B-346) and the downlake site (monitor B-345). Although a pH excursion occurred at the downlake site, aquatic life uses are considered to be fully supported due to the small number of samples collected.

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Activities Potentially Affecting Water Ouality

**Point Source Contributions** 

RECEIVING STREAM FACILITY NAME PERMITTED FLOW @ PIPE (MGD) COMMENT

BROAD RIVER SCE&G/PARR HYDRO STA. PIPE #: 001 FLOW: M/R

PARR RESERVOIR SCE&G/FAIRFIELD PUMPED STORAGE PIPE #: 001 FLOW: M/R

CANNONS CREEK. Revised November 12, 1998 NPDES# TYPE LIMITATION

SC0001864 MINOR INDUSTRIAL EFFLUENT

SC0035904 MINOR INDUSTRIAL EFFLUENT

SC0026921

# NEWBERRY INN/BEST WESTERN PIPE#: 001 FLOW: 0.0255 WOL FOR TRC,NH3N

CHARLES CREEK FOREST HILLS SD/ELBO INC. PIPE#: 001 FLOW: 0.02 WQL FOR DO,TRC,NH3N

# MINOR COMMUNITY WATER QUALITY

PROPOSED

SCG730053

EFFLUENT

PERMIT#

**STATUS** 

SC0024571 MINOR MUNICIPAL WATER QUALITY

MINOR MUNICIPAL

MINOR INDUSTRIAL

WATER QUALITY

KERR CREEK TOWN OF PROSPERITY PIPE #: 00 1 FLOW: 0. 17 WQL FOR DO,TRC,NH3N

ROCKY CREEK TARMAC MID-ATLANTIC, INC. PIPE#: 001 FLOW: M/R

Landfill Activities

SOLID WASTE LANDFILL NAME FACILITY TYPE

NEWBERRY COUNTY LANDFILL MUNICIPAL DWP-117 CLOSED

NEWBERRY COUNTY COMPOSTING MUNICIPAL

361001-3001 ACTIVE

361001-6007

NEWBERRY COUNTY TRANSFER STATION MUNICIPAL

SHAKESPEARE CO. LANDFILL INDUSTRIAL IWP-159 CLOSED

ACTIVE

**Mining Activities** 

MINING COMPANY MINE NAME PERMIT MINERAL

# TARMAC MID-ATLANTIC, INC. BLAIR QUARRY

# 0130-20 GRANITE

# NEWBERRY COUNTY WICKER ESTATE PIT

0299-36 SAND/CLAY

#### Water Supply

None identified in Newberry County.

#### **Growth Potential**

There is a low to moderate potential for growth in this watershed, primarily associated with residential development around the reservoirs, the Town of Jenkinsville, and the City of Newberry. The upper portion of the watershed is effectively excluded from development by the Sumter National Forest, and the overall lack of adequate utilities to serve the remaining area will limit growth.

#### Implementation Strategy

The Broad River is impaired by elevated levels of fecal coliform bacteria due to point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation. The SCDHEC's Watershed Implementation staff will work with agriculture specialists from the SCDHEC and NRCS to determine, if possible, the origin of the bacteria.

#### 2.5.3e Broad River 03050106-060

#### **General Description**

Watershed number 03050106-060 is located in Richland, Newberry, and Fairfield Counties and consists primarily of the Broad River and its tributaries from the Parr Shoals dam to its confluence with the Saluda River. The watershed occupies 160,922 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Taturn-Alpin-Herndon-Pacolet series. The erodability of the soil (K) averages 0.29; the slope of the terrain averages 13%, with a range of 2-25%. Land use/land cover in the watershed includes: 15.47% urban land, 5.62% agricultural land, 1.89% scrub/shrub land, 0.46% barren land, 74.96% forested land, and 1.57% water.

This section of the Broad River accepts drainage from its upper reaches (watershed numbers 03050105-094, 03050106-010, 03050106-050) together with Mayo Creek, **Crims Creek (Rocky Creek, Summers Branch)**, Wateree Creek (Risters Creek), Boone Creek, Freshley Branch, Mussel Revised November 12, 1998 115

Creek, and the Little River Watershed. Hollingshead Creek (Boyd Branch, Wildhorse Branch, Metz Branch, Hope Creek, Bookman Creek) enters the river next followed by the Cedar Creek Watershed, Nipper Creek, Nicholas Creek (Swygert Branch, Moccasin Branch), Slatestone Creek, and Burgess Creek. Crane Creek and Smith Creek enter the river at the base of the watershed near the City of Columbia. Sorghum Branch, Dry Branch (Crescent Lake, Stevensons Lake), Elizabeth Lake (60 acres), and Cumbess Creek drain into Crane Creek followed by North Crane Creek. North Cane Creek accepts drainage from Beasley Creek (Robertson Branch, Lot Branch, Hawkins Branch), Swygert Creek, Dry Fork Creek, and Long Branch. (Note: Creeks in bold are in Newberry County). There are several ponds and lakes (10-60 acres) in this watershed used for recreation, irrigation, and waste water purposes and a total of 311.6 stream miles, all classified "Fresh Water" (FW). The Harbison State Forest is located next to the Broad River just downstream of Nicholas Creek and a Heritage Trust Preserve is located along Nipper Creek.

Water Quality

A fish consumption advisory has been issued by the SCDHEC for mercury and includes portions of the Broad River in this watershed (see Watershed Evaluations and Implementation Strategies Within Watershed Management Unit-0502).

**Broad River** - There are three monitoring sites along this section of the Broad River. Aquatic life uses may not be supported at the upstream site (monitor B-236) due to the occurrence of pesticides (P,PDDT, P,PDDE, endrin) and high concentrations of the PAHs benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene in sediment samples. Recreational uses are partially supported due to fecal coliform bacteria excursions. Aquatic life and recreational uses are fully supported at the midstream site (monitor B-337). At the downstream site (monitor B-080), aquatic life uses are not supported due to occurrences of copper and zinc in excess of the aquatic life acute standard. In addition, there is a significantly decreasing trend in dissolved oxygen concentration. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus and total nitrogen concentration at both the upstream and downstream sites suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions. This river was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

#### Activities Potentially Affecting Water Quality

#### **Nonpoint Source Contributions**

The Broad River, Crane Creek, and Smith Branch are included on the 1996 §303(d) tertiary list due to concerns for fecal coliform bacteria.

Landfill Activities

Revised November 12, 1998

None identified in Newberry County.

Water Supply

None identified in Newberry County.

Groundwater Concerns

None identified in Newberry County

**Growth Potential** 

None identified in Newberry County.

#### Implementation Strategy

The Broad River is impaired by elevated levels of pesticides, PAHS, zinc, copper, and fecal coliform bacteria from point and nonpoint sources. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation. The SCDHEC's Watershed Implementation staff will work with agriculture specialists from the SCDHEC and NRCS to determine, if possible, the origin of the nonpoint source related bacteria.

#### 2.5.2 Stream Flow Data

The following stream flow data is from the U.S. Geological Survey Water-Data Report SC-96-

1.

#### Enoree River at Whitmire

Water year 1996 annual Mean	629 cfs
Water years 1974-1996 Annual Mean	580 cfs
Water years 1974-1996 Highest Annual Mean	859 cfs (1984)
Water years 1974-1996 Lowest Annual Mean	267 cfs (1988)
Water year 1996 Highest Daily Mean	5,340 cfs (February 4)
Water year 1996 Lowest Daily Mean	189 cfs (July 22)
Water year 1974-1996 Highest Daily Mean	22,700 cfs (August 29, 1995)
Water year 1974-1996 Lowest Daily Mean	51 cfs (October 9, 1981)

Indian Creek above Newberry

Water year 1996 annual Mean Revised November 12, 1998 56.5 cfs

### Water year 1996 Highest Daily Mean Water year 1996 Lowest Daily Mean

1,500 cfs (February 3) 4.3 cfs (August 24)

### Broad River near Alston

Water year 1996 annual Mean7,567 cfsWater years 1981-1996 Annual Mean6,072 cfsWater years 1981-1996 Highest Annual Mean9,649 cfs (1993)Water years 1981-1996 Lowest Annual Mean3,100 cfs (1988)Water year 1996 Highest Daily Mean53,600 cfs (February 4)Water year 1996 Lowest Daily Mean1,300 cfs (July 15)Water year 1981-1996 Highest Daily Mean106,000 cfs (October 14,1990)Water year 1981-1996 Lowest Daily Mean242 cfs (June 30, 1985)

#### Parr Shoals Reservoir at Parr

Extremes since 1941 Maximum Elevation Minimum Elevation

266.98 (July 8, 1988) 254.65 ft. (August 21, 1988)

Extremes for water year 1996 Maximum Elevation Minimum Elevation

265.03 ft. (May 17, 1996) 258.15 ft. (October 13, 1995)

#### 2.5.4 Ground Water Contamination Inventory

Table N-3 gives a ground water contamination inventory of Newberry County. Only a portion of the table is included in this plan. The column containing remarks has been omitted.

#### TABLE N-2

# GROUND WATER CONTAMINATION INVENTORY NEWBERRY COUNTY 1997

Source: <u>South Carolina Ground-Water Contamination Inventory</u>, South Carolina Department of Health and Environmental Control, Bureau of Water, July 1997

Contamination	Type of S	Source of
Incident	<b>Contamination</b>	<b>Contamination</b>
American Fiber and Fishing	Petroleum	Underground Storage Tank
B&F Restaurant	Volatile Organic Compound	ls Unknown
Bingham's County Store	Petroleum	Underground Storage Tank

C.D. Coleman Oil Co. Coburg Dairy, Inc. Coleman Oil Company Department of Social Services Dreher Island State Park Ellico Enmark #380 Enmark #380 Gate Petroleum #315 Haltiwanger's 66 Joye's Self Service Judy's Convenience Store Kneece's 66 Li'l Cricket #255 Li'l Cricket #256 Li'l Cricket #257 Livingston's 66 Station Midway Oil Company Mr. K.I. Exxon Newberry Co. Public Works Newberry County Home Well Newberry County Land Fill DWP-117 Newberry County Maint. Shop Newberry Inn Newberry Maintenance Facility Newberry Oil Co. Oakland 66 **Ouick Stop** Schmauder Swing Transport Inc. The County Store Vernon Mills-Whitmire (Former)

Petroleum Petroleum Volatile Organic Compounds Petroleum Volatile Organic Compounds Volatile Organic Compounds Volatile Organic Compounds Petroleum Volatile Organic Compounds Petroleum Petroleum Petroleum Petroleum Petroleum Petroleum Petroleum Volatile Organic Compounds

Underground Storage Tank Underground Storage Tank Unknown Underground Storage Tank Above Ground Storage Tank Underground Storage Tank Unknown Unknown Land Fills Underground Storage Tank Unknown Underground Storage Tank Pits, Ponds and Lagoons, Spills and Leaks Underground Storage Tank

Wise's Service Station and Grocery

Petroleum

2.6 Soils

Newberry County is situated almost entirely on one physiographic region, the Piedmont Plateau. In general, the southern Piedmont has gently rolling terrain dissected by a dendritic pattern of rivers and streams. Geologically, the county can be divided into three sections, the Carolina Slate Belt of the southern region, the Charlotte Belt of the central region, and the alluvial soils that lie along the rivers.

Underlying most of the southern soils on the Piedmont Plateau is the Carolina Slate Belt, which consists of shale and schists. The principal rock type of this geologic belt is argillite, which has a fine grain texture and concentrations of silica and alumina. These rocks provide the parent material for the Georgeville, Herndon, and Alamance soils which are characterized by gently to strongly sloping terrain, well-drained soils, and clayey subsoils that have a high silt content. Approximately 12 percent of the county lies in the Georgeville, Herndon, and Alamance soil association (U.S. Department of

Agriculture, 1960). Combined with minor Tatum and Helena soils, this southern area is mostly cut over pine forest.

The Charlotte Belt underlies over half the county in the northern region above the Carolina Slate Belt. Areas of upland soils formed from the residuum of weathered granite, diorite, gabbro, homeblende, gneiss, and homeblende schist are found throughout the northern region of the county in irregular northwest to southeast bands. Farthest west is a group of gently sloping to steep soils that cover about 50 percent of Newberry County's land area. The Cecil, Enon, Wilkes, Cataula, and Lloyd soils extend into the most northern reaches of the county and cover most of Sumter National Forest. Less than 10 percent of this association is used for general farming. The Cecil, Appling, and Durham soils, 9 percent of the county, are located in the middle of the county and reach to the northwest and northeast. These sandy loams support crops such as corn, cotton, and small grains. Approximately 18 percent of the county soils are in a gently to strongly sloping band of Cecil, Appling, Lloyd, Durham, Davidson, and Enon soils in the central western region. Most of this acreage is used for general farming, forest land, and pasture. There is a thin band which runs along the Carolina slate belt consisting of Cecil, Appling, Lloyd, and Enon soils. These somewhat stony soils, 5 percent of the county, contain mostly forest land.

The Congaree, Chewacla, Hiawassee, Wickham, and Altivista soils form an association that follows parts of the Enoree, Tyger, Broad, and Saluda Rivers. Formed from weathered material from alluvial deposits washed from granite, gabbro, gneiss, schist, and Carolina Slates, these soils are level to strongly sloping bottomlands and stream terraces. Hardwoods, pines, and some crops are supported in this environment (U.S. Department of Agriculture, 1960).

The various soils of Newberry County are best suited to uses that have adapted themselves to the characteristics of the soil. Fertile soils, which support prime farmlands, cover much of the county. All soils found in the county are low in plant nutrients and organic matter. However, fertilizer and lime can be added to obtain top crop production. Erosion is also a problem for sloping soils when the land is cultivated because productivity is reduced with the loss of the rich surface layer needed for root growth. It also allows sediment to enter the streams and pollute or endanger wildlife. Sloping fields, which have undergone erosion, have clayey spots that are difficult to till and plant when the surface soils are gone. Different management techniques can be used to minimize erosion. Cropping systems, which keep vegetation on the soil for long periods of time, help to hold the soil in place. Contour tillage and terracing reduces the length of the slope and runoff. Leaving crop residue on the soil surface will also hold loose sediments in place and increase infiltration, which in turn reduces runoff. Soils used for nonfarming activities, such as engineering projects have characteristics that could limit their utility. Factors important to development capabilities include load bearing for foundations and streets and permeability for septic tank absorption fields (U.S. Department of Agriculture, 1960).

#### 2.6.1 Crop Productivity

Table N-3 shows crop suitability for each soil type found in Newberry County. See Table N-4 for a guide to rating suitability.

CROP SUITABILITY BY SOIL TYPE Source: <u>South Carolina Soils and Their Interpretations for Selected Uses</u>, Claarence M. Ellerbe; and the Newberry County Clemson Extention Service

Table N-4

	CORN	COTTON	<b>GRAIN SORGRUM</b>	SOYBEANS	TOBACCO	<b>BEANS GREEN</b>	CANTALOUPES	PEPPERS	SWEET POTATOES	TOMATOES	WATERMELONS	BARLEY	OATS	RYE	WHEAT	BAHIA	BERMUDA	DALLIS	TALL FESCUE	MILLET	<b>RYE GRASS</b>	PEACHES	GRAPES	SHRUB LESPEDEZA	MILLET BROWNTOP	<b>CLOVER CRIMSON</b>	<b>CLOVER WHITE</b>	LESPEDEZA ANNUAL	LESPEDEZA SERICEA	
Appling	2	1	2	2		2	2	2	1	2	2	2	2	1	2	1	2	3	3	2	2	2	2	1	1	2	3	2	2	
Cataula	2	2	2	2		2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	<b>2</b> .	2	2	
Cecil	1	1	1	1		2	2	2	1	1	1	l	1.	1	1	. 1	1	2	l	· 1	1 -	1	1	1	I	2	2	2	1	
Davidson	2	2	2	2		2	2	. 1	3	. <b>2</b> .	2	1	1	1	1	1	1	1	1	1	i	2	1	1	2	1	1	1	1	
Enon	3	2	2	2		2	3	3	3	2	3	3	3	2	2	2	3	2	2	2	2	3	3	2	2	2	2	1	2	•
Georgeville	1	1	2	2		3	3	3	3	2	2	1.	1	1	1.	2	2	2	2	1	i	2	1	I	1	1	2	1	l	
Helena	2	2	2	2		. 2	2	<b>`3</b> `	2	2	2	2	2	l	2	2	2	2	2	1	1	3	2	2	I	3	2 "	2	2	
Herndon	2	2	2	2		2	3	3	2	2	3	2	2	2	2	2	2	2	2	1	2	3	2	1	1	1	2	2	. 1	
Hiwassee	L	1	2	1		2	2	<b>2</b> ·	3	<b>2</b> <sup>.</sup>	1	2	1	2	2	1	1	2	2	I	1	1	2	1	1	1	2	2	1	
Madison	1	1	1	1	•	2	1	1	2	1	1	1	1	1	1	3	2	2	2	1	1	1	1	ł	1	2	2	2	1	
Mecklenburg	3	2	2	2		2		3				2	2	2	2	2	2	1	2	2	2	4	4	2	2	2	1	l	2	
Wilkes	3	3	3	4		3	4	3	4	3	4	3	2	2	3	2	3	2	2	3	2	4	4	2	3	2	2	2	2	

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#### TABLE N-4

# GUIDE FOR RATING SUITABILITY OF SOILS FOR SELECTED CROPS WITH LEVEL OF MANAGEMENT THAT TENDS TO PRODUCE THE HIGHEST LEVEL OF ECONOMIC RETURNS

# Source: South Carolina Soils and Their Interpretations for Selected Uses,

# Clarence M. Ellerbe

Suitability Group Number	Corn (bu.)	Grain Cotton (lbs.)	Sorghum (bu.)	(bu.)	Soybeans (lbs.)	Tobacco (bu.)	Oats (bu.)	Wbeat (A.U.M.)	Pasture
1	75+	600+	60+	40+ -	2,400+	70+	40+	8+	
2	50-75	500-600	40-60	25-40	1600-2400	50-70	60-40	6-8	
3	25-50	400-500	20-40	15-25	1200-1600	25-70	20-30	4-6	
4	25	400	20	15 .	1200	25	20	4	

Table N-5 shows the 1996 crop production in Newberry County.

### TABLE N-5a

# 1994 NEWBERRY COUNTY AGRICULTURAL STATISTICS; Source: South Carolina Agricultural Statistics Service

Revised November 12, 1998

1994 Crops	Acres Harvested	Yield	Production	Rank		
Barley for Grain, Bu.	1,350	79	107,00	2		
Corn for Grain, Bu.	2,300	101	232,300	25		
Cotton, Lb. & Bales	-	-	-	-		
Hay, All, Ton	10,900	2.8	30,100	6		
Oats for Grain, Bu.	2,000	69	138,000	5		
Peanuts, Lbs.	_	-	<u> </u>	-		
Rye, Bu	-	-	-	-		
Sorghum, Bu.	1,450	47	68,100	1		
Soybeans, Bu.	3,850	36	138,600	23		
Tobacco, Lbs.	-	-	-			
Winter Wheat, Bu.	7,800	51	398,700	15		
Apples, Lbs.	-	-	<b>—</b> .	-		
Peaches, Lbs.			-	-		

# TABLE N-5b

# 1995 NEWBERRY COUNTY AGRICULTURAL STATISTICS Source: South Carolina Agricultural Statistics Service

1995 Crops	Acres Harvested	Yield	Production	Rank		
Barley for Grain, Bu.	1,650	46	75,900	1		
Corn for Grain, Bu.	2,200	86	189,200	24		
Cotton, Lb. & Bales		•	-	-		
Hay, All, Ton	17,300	2	34,600	5		
Oats for Grain, Bu.	1,750	43	75,300	4		
Peanuts, Lbs.	-	-				
Rye, Bu.	300	26	7,800	16		
Sorghum, Bu.	1,400	46	64,300	2		
Soybeans, Bu.	4,500	28	124,600	23		
Tobacco, Lbs.	-	_		-		
Winter Wheat, Bu.	5,700	33	185,700	17		
Apples, Lbs.	-	_	-	-		
Peaches, Lbs.	-			_		

Revised November 12, 1998

1996 Crops	Acres Harvested	Yield	Production	Rank
Barley for Grain, Bu.	1,200	52	62,900	1
Corn for Grain, Bu.	2,800	71	199,900	25
Cotton, Lb. & Bales	440	545	500	32
Hay, All, Ton	14,800	1.9	28,400	3
Oats for Grain, Bu.	1,250	45	56,300	10
Peanuts, Lbs.	_	-	_	-
Rye, Bu	300	34	10,300	16

# TABLE N-5c 1995 NEWBERRY COUNTY AGRICULTURAL STATISTICS Source: South Carolina Agricultural Statistics Service
Sorghum, Bu.	850	55	47,000	2	
Soybeans, Bu.	4,150	26	109,500	23	.,
Tobacco, Lbs.	-	-	-	-	
Winter Wheat, Bu.	4,800	37	175,500	17	
Apples, Lbs.		_	-		
Peaches, Lbs.	-	-	-		

#### 2.7 Minerals

According to the South Carolina Geological Survey, there is no active mining in Newberry County. Even though there are substantial granite resources in the county, there are no active granite quarries in the county. There is a brick quarry on the Saluda River, and there are several abandoned quarries throughout the county.

#### 2.8 Natural Hazards

According to the South Carolina Geological Survey, there are serval fault zones in Newberry County, including one which runs through Lake Murray. While there is very little historic data available to determine earthquake risks, it should be noted that liquefaction along the flood zones is likely in the event of an earthquake. Due to the abundance of granite there is a low to moderate risk of radon. There is a low to non-existent risk of landslides.

#### 2.9 Air Quality

According to the 1996 annual report of the South Carolina Department of Health and Environmental Control, Bureau of Air Quality, there were no air monitoring sites in Newberry County. While there are sites in Edgefield, Abbeville, Occonee, Pickens, Anderson, Greenville, and Spartanburg Counties, the effects of any pollutants monitored at this sites on Newberry County are unclear.

#### 2.10 Recreation

#### 2.10.1 City of Newberry

Lynch's Woods is a 331 acre primitive area located along US 76. Even though Lynch's Woods is located in the City of Newberry, it is owned by Newberry County.

#### 2.10.2 State Facilities

The Dreher Island State Park is located at 2677 State Park Road in Prosperity. The park covers 348 acres and offers picnic areas, boating docks, camp facilities, and log cabins.

2.10.3 National Facilities

Sumter National Forest is located to the north of the City of Newberry, and is bounded by Highway 76 to the west and Highway 34 to the south. There are 55,000 acres in the Newberry County portion of the Sumter National Forest. Table N-6 lists the recreational facilities associated with the Sumter National Forest located in Newberry County:

# TABLE N-6 SUMTER NATIONAL FOREST RECREATIONAL FACILITIES Source: U.S. Department of Agriculture Website http://www.fs.fed.us/r8/fms/rec.htm

Name	Facilities	Location
Brick House Campground	23 campsites with tables, grills, and lantern holders; centrally located water faucets; restrooms	From Whitmire, take S.C. Route 66 southwest for 6.2 miles to Forest Service Road 358; turn left (south) and drive for 0.3 miles.

Molly's Rock Picnic Area	Self guided interpretive trail; accessible fishing pier, picnic shelter, and restrooms; drinking water, several picnic tables and grills; large grassy area for game playing	From Newberry take S.C. Route 121 north 9.5 miles to U.S. Route 176; turn right (southeast) and dive 2 miles to Forest Service Road 387; turn left and drive 2 miles.
Enoree Rifle Ranges	Backstops placed at 35 and 100 yard intervals; one shooting bench is accessible to disabled visitors; paved path to backstops; paved parking lot	From Newberry, take S.C. Route 121 north for 9.4 miles
Enoree Off- highway Vehicle Trail Enoree Off- highway Vehicle Trail (cont.)	Travel Time: Trail is a series of continuous loops. Rides could range from half an hour to all day. Surface Type: Sandy and Piedmont clay Difficulty Level: Easy to moderately difficult Season: Year round Drinking Water: None Trail blaze: Light gray plastic diamonds and bright yellow paint	From Whitmire head west on U.S. Highway 72. Turn left onto Forest Service Road 366 (Garlington Road)
Collins Creek Camp	Primitive campground	From Whitmire, take S.C. Highway 121 southeast 3.2 miles. Drive northeast on S.C. Highway 45 for 4.2 miles. Turn right on Forest Service Road 393 and drive .6 miles.
Rocky Branch Campground	Primitive campground	From Newberry drive northwest on S.C. Highway 34 for about 18 miles. Turn left (north) on Forest Service Road 412 and drive about 2 miles to the camp.
Tip Top Campground	Primitive campground	From Whitmire take S.C. Highway 72 west for 9 miles
Willow Oak Campground	Primitive campground	From Newberry, take S.C. Highway 121 north for 9.5 miles to U.S. 176. Turn right and drive 2 miles to Forest Service Road 387. Turn left and drive 3.1 miles to Forest Service Road 386. Turn left and drive 1.7 miles to the campground.

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Buncombe Horse Trail	Length: 28 miles Trail Time: Varies Surface Type: Unsurfaced, gravel, piedmont clay Difficulty Level: Easy to more difficult Recommended Season: Year round Drinking Water: Drinking water can be found at Brick House Campground. Stream water is unsafe to drink Trail Blaze: Painted white blazes, signs, and brown mile markers.	From S.C. Route 66 turn south on Forest Service Road 358. Left side of road is trailhead parking. Brick House Campground is 0.3 miles further south.
Enoree River Canoe Trail	Length: 36 miles Difficulty Level: Moderate, novice paddler or better. Water Type: No white water. Fast-moving flatwater, 2 to 6 feet deep. Recommended Season: Late spring, summer, and fall. Drinking Water: Plan your water needs before trip. River water is not safe to drink. Boat Size: Cances and flat-bottom boats less than 14 feet long are recommended. Camping: Primitive camping is allowed on National Forest land along the river by permit only. Group camping facilities are available upon request. Trash: Pack it in pack it out.	Access: Jones Bridge on State Secondary Road 98, Forest Service Road 336A, Forest Service Road 339 boat ramp, Forest Service Road 390A, Brazzlemans Bridge boat ramp on State Secondary Road 81, Keitt-s Bridge on State Secondary Road 45. After Enoree River empties into the Broad River, about 4 miles south is Strothers State Boat Ramp.
Tyger River Canoe Trail	Length: 24 miles Difficulty Level: Moderate, novice paddler or better. Water Type: No white water. Fast-moving flatwater, 2 to 6 feet deep. Recommended Season: Late spring, summer, and fall. Drinking Water: Plan your water needs before trip. River water is not safe to drink.	Access: Cedar Bluff Bridge on Highway 49, Forest Service Road 323, Rose Hill Boat Ramp on State Road 16, Beatty-s Bridge Boat Ramp on U.S. Highway 176. After Tyger River empties into Broad River, about 7 miles south is Strothers State Boat Ramp.

	Boat Size: Canoes and flat-bottom boats	
	less than 14 feet long are recommended.	
	Camping: Primitive camping is allowed on	
	National Forest land along the river by	
	permit only. Group camping facilities are	
	available upon request.	
~	Trash: Pack it in pack it out.	

According to the local office the United States Forest Service, the number of acres available as timber land in the Sumter National Forest is not broken-down by County. Based on the Land and Resource Management Plan, 80-85% of the entire Sumter National Forest is considered timberland.

2.11 Municipalities

2.11.1 Town of Peak

Soils: The Pacolet-Madison-Cecil classification is the most abundant soil around the Town of Peak.

<u>Nearest Streams</u>: The town is adjacent to the Broad River and Rocky Creek. Both are outside of the town.

Source of Water Supply: The town receives its water supply through wells.

Flood hazard areas: Based on 1990 Flood Insurance Rate Maps, the only flood hazard areas are "A" zones associated with the Broad River and Rocky Creek. "A" zones are areas where the base flood elevation has not been determined.

<u>Water quality and capacity of streams</u> While there is no flow data for Rocky Creek, the 1996 water year mean for the Broad River near Alston was 7,567 cfs. Please see the discussion of watershed number 03050106-060 for water quality concerns of the section of the Broad River adjacent to the town.

<u>Ground Water Quality</u>: While there are no ground water concerns for Newberry County in the Broad River Basin, please see Table N-3 for any specific ground water contamination sites.

#### 2.11.2 Town of Pomaria

Soils The most abundant soil in the town is the Pacolet-Madison-Cecil classification.

Nearest Stream: Crims Creek and one of its branches flow through the town.

Source of Water Supply: The town receives its water supply from the Newberry County Water and Sewer Authority.

Flood hazard areas: Based on the 1990 Flood Insurance Rate Map, the flood hazard areas in the town are "A" zones associated with Crims Creek and its tributary. "A" zones are areas where the base flood elevation has not been determined.

<u>Water quality and capacity of streams</u>: There is not stream flow data available for the creeks near the town.

<u>Ground Water Quality</u>: While there are no ground water concerns for Newberry County in the Broad River Basin, please see Table N-3 for any specific ground water contamination sites.

#### 2.11.3 Town of Prosperity

Soils: The most abundant soil in the town is the Cecil-Hiwassee-Cataula classification. <u>Nearest Streams</u>: Kerr Creek, Camping Creek, and a Branch of Timothy Creek are all within the town limits.

Source of Water Supply: The town is connected to the Newberry County Water and Sewer Authority for both supply and demand as required.

Flood Hazard Areas: Based on 1990 Flood Insurance Rate Maps, the flood hazard areas in the town are "A" zones associated with the Kerr Creek, Camping Creek, and the Branch of Timothy Creek. "A" zones are areas where the base flood elevation has not been determined.

<u>Water quality and capacity of streams</u>: There is no stream flow data for the creeks in the town. Please see the discussion of watershed number 03050109-190 for water quality concerns in Camping Creek.

<u>Ground Water Quality</u>: While there are no ground water concerns for Newberry County in the Saluda River Basin, please see Table N-3 for any specific ground water contamination sites.

#### 2.11.4 Town of Silverstreet

Soils: The abundant soils in the town are the Pacolet-Cecil-Enon and Cecil-Appling-Hiwassee classifications.

<u>Nearest Streams</u>: Beaver Dam Creek, and Turners Branch are within the town limits. Welch Creek is adjacent to the town.

<u>Source of Water Supply</u>: The town receives its water supply from the Newberry County Water and Sewer Authority.

**Flood hazard areas:** Based on the 1990 Flood Insurance Rate Maps, the flood hazard areas in the town are "A" zones associated with the Beaver Dam Creek, Turners Branch and Welch Creek. "A" zones are areas where the base flood elevation has not been determined.

<u>Water quality and capacity of streams</u>: There is no stream flow data for the creeks within and adjacent to the town.

<u>Ground Water Quality</u>: While there are no ground water concerns for Newberry County in the Saluda River Basin, please see Table N-3 for any specific ground water contamination sites.

#### 2.11.5 Town of Whitmire

Soils: The abundant soil in the town is the Pacolet-Cecil-Enon classification.

<u>Nearest Streams</u>: The town is located between the Enoree River and Duncan's Creek. Neither the river nor the creek flows into the town.

Source of Water Supply: Duncan Creek serves as the source of the town's water supply.

Flood hazard areas: Based on the 1990 Flood Insurance Rate Maps, the flood hazard areas in the town are "A" zones associated the Enorce River and Duncan's Creek. "A" zones are areas where the base flood elevation has not be determined.

<u>Water quality and capacity of streams</u>: While stream flow data for Duncan Creek is not available, the Enoree River at Whitmire had a water year 1996 mean of 629 cfs. Please see the discussion of watershed number 03050108-040 for water quality concerns of Duncan Creek.

<u>Ground Water Quality</u>: While there are no ground water concerns for Newberry County in the Broad River Basin, please see Table N-3 for any specific ground water contamination sites.

#### 2.11.6 Town of Little Mountain

Soils: The abundant soil in the town is the Pacolet-Madison-Cecil classification.

Nearest Streams: There are no streams within or immediately adjacent to the town.

Source of Water Supply: The town receives its water supply from the Newberry County Water and Sewer Authority, and through wells.

Flood hazard areas: Base on the 1990 Flood Insurance Rate Maps, there are no flood hazard areas within or immediately adjacent to the town.

Water quality and capacity of streams: Not applicable

<u>Ground Water Quality</u>: While there are no ground water concerns for Newberry County in the Broad River and Saluda River Basin, please see Table N-3 for any specific ground water contamination sites.

#### 2.11.7 City of Newberry

Soils: The abundant soil in the city are the Cecil-Hiwassee-Cataula and Pacolet-Cecil-Enon classifications.

Nearest Streams: Scott's Creek and Scott's Creek Tributary flow through the town.

Source of Water Supply: The Saluda River serves as the source of the city's water supply. Flood hazard areas: Based on the 1990 Flood Insurance Rate Map, the flood hazard areas in the city are "A" zones associated Scott's Creek and Scott's Creek Tributary. "A" zones are areas where the base flood elevation has not been determined.

<u>Water quality and capacity of streams</u>: While there is not stream flow data for Scott's Creek and Scott's Creek Tributary, the Saluda River at Chappells had a water year 1996 mean of 2,226 cfs. Please see the discussion of watershed number 03050109-150 for water quality concerns of Scott's Creek, and of the section of the Saluda River that serves as the water supply for the City.

<u>Ground Water Quality</u>: While there are no ground water concerns for Newberry County in the Saluda River Basin, please see Table N-3 for any specific ground water contamination sites.

3 Needs and Goals

The following objectives for the natural resources element were identified in the 1976 Development Plan for Newberry County:

- To ensure the quality and quantity of the water supply;
- To encourage soil conservation and erosion control;
- To promote property drainage to prevent flooding;
- To discourage development in areas with severe soil limitations;
- To encourage watershed planning;
- To utilize erosion control methods to preserve valuable topsoil, and
- To encourage the coordination of construction of water and sewage systems to ensure against pollution of the water table and surface water supplies.

Additionally, the County should establish land use and land development standards around Lake Murray and Lake Greenwood.

In a 1994 statewide survey conducted by the University of South Carolina Institute of Public affairs for the South Carolina Department of Parks, Recreation and Tourism, the number one recreational activity for those ages 12 and older was waking. 80.2% said that they had walked for pleasure or exercise within the past 12 months. (SCORP). As was noted in a Newberry County, SC Comprehensive Outdoor Recreational Study prepared in 1966, "Significant resources for recreation in Newberry County are limited primarily to parks and recreation areas in the City of Newberry; the state parks adjacent to the county or close by, and the rivers and reservoirs." As Table 1 shows, most of the recreational facilities are still located in the City of Newberry. Sumter National Forest offers several campgrounds and a few trails, but these are not convenient for all residents of the county. The 1966 study proposed a series of scenic and historic tours throughout the county "... to provide a better means of showing historic features and many of the beauty spots in the County to the residents and visitors who are going to be engaged in driving for pleasure." The study also proposed several parks near unique natural features, including:

- A scenic observation point on the high ground near the Town of Little Mountain;
- A small county park with a boat ramp and dock on the Parr Reservoir;
- A county park on the Bush River Soil and Conservation Flood Control Impoundment near the City of Newberry.

Goal for Newberry County: A natural resources element for Newberry County is to:

- To continue to implement the natural resources objectives identified in the 1976 Development Plan for Newberry County, SC ;
- Develop the recreational facilities as proposed in the 1966 Newberry County, SC Comprehensive Outdoor Recreation Study.
- 4. Implementation Strategies and Time Frames

Implementation strategies and time frames for achieving the natural resources element goals are included in Chapter Eight of this Comprehensive Plan.

# MAP OF GENERALIZED SOIL ASSOCIATIONS

Revised November 12, 1998

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# MAP OF WATERSHEDS

Revised November 12, 1998

# MAP OF NATURAL RESOURCES

Revised November 12, 1998

# CHAPTER IV HISTORICAL AND CULTURAL RESOURCES

#### A. Newberry County

#### 1. Inventory

#### Historic Background - Newberry County

Lying in the fork of the Broad and Saluda Rivers, Newberry County was settled in the middle of the eighteenth century by immigrants of Scotch-Irish, English, and German stock who traveled from Pennsylvania, Virginia, and North Carolina seeking new homes along the Carolina frontier. As a part of the Old Ninety Six Judicial District established in 1769, this upcountry area retained its frontier characteristics until after the Cherokee was formed in 1785. Newberry County was formed in 1785 when the Ninety Six District was divided into six counties. Initially an area of small, independent and diversified farmers and sturdy artisans, the area experienced radical changes both in its society and economy after the introduction of the cotton gin in the late eighteenth century. Large cotton plantations were developed.

Graced by business and professional leaders of perception and foresight, Newberry County secured the first upcountry railroad line in 1851, making the village of Newberry (established 1789) the leading inland cotton market of the pre-war period. Interestingly, while the village in its early years did have a courthouse, jail, school, burial ground, postmaster and library society, it had no church during the first 40 years. Concern with education was apparent in Newberry since there were a lot on antebellum schools, helping fill in education needs until a public school system was formed in 1891.

Since the end of the Civil War, Newberry County continued to struggle as a primarily agricultural driven economy. Not until the end of the Second World War did the economy of the County begin to change toward manufacturing. The County's agricultural strength, while remaining strong during the early 1900's, began to decline as manufacturing and other major industries began moving to the area. Today, the County enjoys a growing economic base in light manufacturing, education and trade. However, many of the small communities in the County have declined in population as a result of shifts in employment trends.

It was from the plantation and early cotton and lumber mill years that many of the County's finer homes and buildings were constructed.

#### **Historic Sites and Structures**

The following table lists the historic sites and structures for Newberry County. The information was collected from four sources: The National Register of Historic Places; <u>The Consolidated</u>

<u>Inventory of Regional Natural Resources and Infrastructure</u>, prepared in June 1996 by Central Midlands Regional Planning Council; the <u>Central Midlands Historic Preservation Survey</u> prepared in 1974 by Central Midlands Regional Planning Council, and a survey conducted in the mid 1980's by Nancy Fox for the S.C. Department of Archives and History. Dates with an \* next to them indicate the date that the item was listed on the National Register of Historic Places.

# TABLE C-1 HISTORIC SITES AND STRUCTURES IN THE UNINCORPORATED AREA OF NEWBERRY COUNTY

Sites and Structures	Year	Location
A.J. Myers House Site # 718	1903	E side County Rd.28, .1mi. N of intersection with County Rd. 97
A.P. Jolly Ruff Site # 698	ca. 1825	NE side junction of County Rd.499 & SC 219
A.P. Dominick House Site #317	ca. 1850	N side US 76 (Wheeler Avenue.)
Adam Monts House Site # 324	ca. 1952	E side SC 391, 1.5 mi. NE of Blacks Bridge
Adam Aull House, Barn Site # 397	ca. 1860	S side of Dirt Rd. W of SC 202, 2 1/4 mi. N of I-26
Alexander Crosson Log House Site # 663 fair	ca. 1772	S side County Rd. 44 (across Hellers Creek), 2 mi. E of US 176
Andrew Wicker House Site # 699 fair	ca. 1880	W side County Rd. 499, .5 mi. E of junction with SC 219
Andrew Langford House Site # 265	ca. 1885	E side County Rd. 49, SE junction with County Rd. 278
B.B. Leitzsey House Site #734 fair	ca. 1905	N side County Rd. 44, .4 E of I-26
Barr Wheeler House & Outbuildings Site # 391	ca. 1820	N side County Rd.25, E of County Rd. 164
Battle of Williams Plantation Site	December 31, 1780	on Mudlick Creek at the Laurens County line
Bennett Connelly House Site # 350 fair	ca. 1825 .	2.8 mi. S of Prosperity on E side of SC 391
Berry Richards House Site # 724 fair		2 mi. E of County Rd. 54, .8 mi. E side of Hunt Club Rd.

Bethlehem Lutheran Church	1882	W side County Rd. 97 at junction with US 17
Betty Halfacre House Site # 682	ca. 1800	N side SC 219, 1 mi. E of County Rd. 82
Boozer House Site # 286 dilapidated	ca. 1780	on County Rd 42, 1 mi. E of County Rd. 315
Bowers-Stockman House Site # 339 poor	ca. 1840	2.8 mi. S of Prosperity, on W side of SC 391
Brooks-Warner House Site # 338 poor	ca. 1820	S side County Rd. 197, 1 mi. E of SC 391
Brother Brown House Site # 655	ca. 1836	E side County Rd. 44, 2 mi. NE I-26 overpass
Bruce Wessinger Site # 590	ca. 1900	N side US 76, 2 mi. W of intersection with SC 391
Burr Boozer House & Outbuildings Site # 320	1890	.8 mi. SE of County Rd. 41, W side County Rd. 17
Bush River Road	1768	Newberry County
Bush River Baptist Church Site # 639	1917, 1812	S side County Rd.56, E of SC 560
Bush River Centralized High School Site # 638	1927	N side County Rd. 56, .5 mi. E of junction with County Rd. 96
Cal Wicker House & Outbuildings Site # 701 fair	ca. 1890	end of dirt road, W of County Rd. 371, 1.5 mi. S of intersection with SC 34
Caldwell House	c. 1850's	Intersection of US 176 and Bethel Garmany Rd.
Caldwell-Ruff House Site # 736 poor	ca. 1865	S side SC 219, immediately E of intersection with County Rd. 299
Capers Crumpton House Site # 691 poor	ca. 1830	N side of Sc 219, 1 mi. SE of junction with County Rd. 499
Captain George Epting House & Outbuildings Site # 446	R-side: 1832 L-side: 1913	N side County Rd. 285, 1/8 mi. SE County Rd. 167
Captain John Williams House Site # 271 <i>ruins</i>	ca. 1830	E side County Rd. 49, S of junction with County Rd. 58
Chalmers-Brown House Site # 658	ca. 1840	S side County Rd.44, 2.2 mi. E of I-26
Charlie Shealy House Site # 394	ca. 1850	W side SC 202, <b>2</b> mi. S of I-26



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Clara Riddlehoover House Site # 715	ca. 1903	N side County Rd. 98, 1.5 mi. E of County Rd. 494
Coleman & Scurry Cotton Gin Site # 608	1920	in forks of hwys SC 39 and SC 56
Coleman & Scurry Office Site # 609	1920	W side of SC 39 at junction with SC 56
Colonel Benjamin Maybin House Site # 7 <u>27</u>	ca. 1820	E side County Rd. 45, 2 mi. SE junction with County Rd. 54
Colonel John S. Renwick House Site # 631	1846	end of dirt road, W side County Rd.81, 5 1/4 mi. NE Newberry city limits
Coppock House Site # 290 <i>vacant</i>	ca. 1800	E side of County Rd.66, .5 mi. S of County Rd. 273
Creighton Dominick Site # 335	ca. 1895	W side of County Rd. 71, .2 mi. S of County Rd. 187
Cromer-Harmon House Site # 671	1854	S side of SC 34, 2 mi. E of County Rd. 55
Cromer-Wicker-Buzzard House Site # 667 <i>fair</i>	ca. 1840	W side of County Rd. 38, .3 mi. E of I-26
Crossroads Baptist Church Site # 617	1835	W side of County Rd. 48, 2 mi. NE of junction with SC 34
Dan Boland House Site # 378	1885	E side of intersection of County Rds. 20 & 271
Dan Ward House Site # 281	1800	N side of SC 34, W of County Rd. 363
Daniel Livingston House Site # 260		E side County Rd. 121, 25 mi. W of Silverstreet
Daniel Suber House Site # 405	ca. 1860	W side of County Rd. 28, 1 mi. S of County Rd. 97
Darby-Ringer House Site # 665 <i>poor</i>	ca. 1840	W side County Rd. 55 at junction with County Rd. 500
David Halfacre House Site # 680	1845	SE intersection of County Rd 611 and SC 219
David Luther Ruff Tenant House Site # 690 fair	ca.1900	E side SC 219, 3/4 mi. NE intersection with County Rd. 99
Dick Hipp Home Site # 409	ca. 1883	N side of County Rd. 33, 3/4 mi. E of Pomaria
Dominick Fellers House Site # 325	ca. 1845	W side of County Rd. 226, 1 mi. S of SC 391
Dominick Fulmer House Site # 344	ca. 1830	N side of County Rd. 72, 1/4 mi. SE of County Rd. 26
Dr. William O. Holloway House	ca. 1905	E side SC 39, .8 mi. N of intersection with SC 341

Site # 614		
Dr. Andrew Longshore House Site # 269	ca. 1900	S side of Deadfall Rd., Silverstreet
Dr. D.A. Cannon House and Servants House Site # 283	ca. 1870	S side County Rd. 83, 5 mi. W of Silverstreet
Dr. Frances Colmes House Site # 315		N side SC 66, E of Laurens County Line, 5 mi. SW of Whitmire
Dr. George Washington Glenn House Site # 633	1802	E side County Rd. 81, 3 mi. N of I-26
Dr. J.O. Dickert House Site # 729 demolished 1980	ca. 1850	W side SC 39, .4 mi. N of intersection with County Rd. 365
Dr. Jake Norris House Site # 721 poor	ca. 1845	N side dirt road, .5 mi. W of County Rd. 733
Dr. James K. Chapman House & Office Site # 251	1864	E side County Rd. 435, 1/4 mi. N of junction with US 176
Dr. M.A. Renwick House Site # 630	1846	W side County Rd. 481, # mi. SE of junction with County Rd. 32
Dr. Richard Pinckney Clark House Site # 626	ca. 1850	6 mi. NW of Newberry, SW of intersection US 76 & County Rd 42
Dr. W.A. Dunn House Site # 425	ca. 1900	E side SC 773, SE of intersection with US 176
Drayton Hamm Site # 267	ca. 1870	County Rd. 83, just before entering Silverstreet
Dry Branch Farm Site # 705	ca. 1880	E side County Rd. 351, 13/4 mi. E of junction with County Rd. 272
Ebenezer Methodist Church Site # 740	1880	N side County Rd. 67, t intersection with County Rd. 68
Ebenezer Methodist Church Site	1780s	on County Rd. 81, 2 mi. of its intersection with County Rd. 45 in Maybinton Section
Ed Halfacre House Site # 683	ca. 1890	S side SC 219, 3/4 mi. SE of junction with County Rd. 499
Elijah Martin House Site # 258	ca. 1878	Route 3, W side County Rd. 276, 1 mi. S of County Rd. 59
Enoree Baptist Church	1859	on U.S. 176, 1/4 mi. N of the intersection with S.C. 34
Epting Graham House Site # 714	ca. 1840	SE side County Rd. 98, 1 1/4 mi. E of County Rd.97
Epting House Site # 351 poor	ca. 1850	E side County Rd. 26, 2.8 mi. SE County Rd. 340
Euclydus Longshore House Site # 273	1886	N side County Rd. 278, 1 mi. N of County Rd. 49
Ezekial Perry Matthews House	ca.1850	S side County Rd. 56, .1 mi. W of junction with County Rd.

Site # 642	· · · · · · · · · · · · · · · · · · ·	342
Fair-Ruff House Site # 591	ca. 1820	S side of US 378, 1.2 mi. W of intersection with 391
Fairview Baptist Church Site # 627 fair	1859	E side of County Rd. 63, 1/4 mi. S of I-26 overpass
Fellers Mills House Site # 720	1885	E side of US 76, 2 mi. S of City of Newberry
Fike-Sease-Fulmer House Site # 380	18th century	E side of County Rd. 27, .2 mi. NE of County Rd. 72
Floyd Satterwhite House Site # 643	1800	W side of County Rd. 64, 1/4 mi. S of junction with County Rd. 56
Frances Higgins House Site # 279 <i>poor</i>	ca. 1850	2 mi. NW of Saluda River on SC 121
Fulmer Shealy House Site # 347 poor	ca. 1850	E side of County Rd. 340, .8 mi. SE of County Rd. 544
G.M. Neel General Store Site # 649	ca. 1943	SW of junction of County Rds. 58 & 388, on W side of 388
G.M. Shealy House & Outbuildings Site # 387	1892	E side of County Rd. 211, 2 mi. S of US 76
General Henry Koon House & Dr.'s House Site # 632	ca. 1849	E side of County Rd. 81, 1.2 mi. NE of Newberry City Limits, SW of County Rd. 275
George Bundrick House Site # 713	1880	S side of County Rd. 98, 1 2 mi. E of junction with County Rd. 97
George (Guinea) Shealy House & Outbuildings Site # 392	ca. 1835	N side of County Rd. 24, E of County Rd. 25
George Krell House Site # 346	ca. 1840	NW corner of intersection of County Rds. 26 & 20
George Metts House & Outbuildings Site # 386	ca. 1845	N side of County Rd. 515, .1 mi. E of County Rd. 211
George Samuel Moore Site # 330	ca. 1880	W side of County Rd. 71, .2 mi. S of County Rd. 587
George Schumbert Site # 282	ca. 1840	intersection of County Rd. 83 & SC 395
Gilders Creek House Site # 629 <i>ruins</i>	ca. 1850	W side of County Rd. 481, 1 mi. NW of junction with County Rd.81
Gilliam House Site # 628 fair	1830	N side of County Rd. 32, .5 mi. E of I-26
Gilliam House	ca. 1870	N side of County Rd. 44, 1 mi. W of US 176

Site # 662 <i>fair</i>		
Glascow McCrackin House Site # 625	ca. 1907	N side of US 76, 1 mi. W of intersection with County Rds. 342 & 32
Govan Luther Sease House & Gin Store Site # 679	1836	W side of County Rd. 611, .5 mi. S of intersection with SC 219
Graham House Site # 707 <i>fair</i>	ca. 1810	W side of County Rd. 272, at intersection with County Rd. 667
Hampton Luther Sease, Sr. House Site # 703	1907	N side of County Rd. 82, 1/4 mi. E of County Rd. 371
Hardy House	c.1804	off of County Rd 45 Z mi. NW of its intersection with County Rd. 81 in Maybinton Section
Hardy Suber House Site # 716	ca. 1860	E side of County Rd. 28, .2 mi. S of junction with SC 34
Hartford School Site # 738	1935	W side of SC 395, S of intersection with SC 39
Heads Tavern Site # 272 poor	ca.1820	W side of 121 at Deadfalls Crossroads
Hellers Church Site # 704	1885	N side of County Rd. 250, .5 mi. W of junction with County Rd. 28
Henderson Residence	c.1820	on County Rd. 45 where it crosses Enoree River in Maybinton Section
Henry Boozer House & Outbuildings Site # 321	1825	W side of County Rd. 360, 1.3 mi. SE of County Rd. 237
Henry Burton House Site # 652	1840	N side of County Rd. 48, 2.2 mi. SW of junction with County Rd. 58
Henry Coate House Site # 258	ca. 1825	S side of County Rd. 363, 2 2 mi. SW of Silverstreet
Henry Dominick House & Outbuildings Site # 336	ca. 1830	E side of County Rd. 71, 1 mi. SE of County Rd. 197
Henry Thomas Fellers House Site # 284	ca. 1870, 1905	on SC 34, 3/4 mi. from County Rd. 577
Henry Workman House Site # 607 <i>fair</i>	1904	W side of SC 39, N of County Rd. 506
Hezzie Jackson House Site # 257	ca. 1800	E side of County Rd. 577, 1.5 mi. S of junction with SC 34
Hipp-Setzler Home Site # 398	ca.1800	N side of County Rd. 492, 3/4 mi. E of SC 202
Holland-Crooks House Site # 717	ca. 1885	W side of County Rd. 28, .1 mi. N of intersection with County Rd. 97

Holloway House Site # 249	ca. 1825	S side of SC 107
Howard Morris House & Cotton Gin Site # 323	ca.1860	W side of County Rd. 231, 2 mi. S of County Rd. 407
Hugh O'Neal House Site # 293	1770s	7 mi S of Newberry, E side of SC 295
Hunter Turner House Site # 318	ca. 1800	4.8 mi. SW of Prosperity, L side of County Rd. 244
I.M. Smith & Brothers Store at Independence Site # 647	ca. 1899	N side of County Rd. 96, 2 2 mi. W of junction with County Rd. 56
I.M. Smith, Sr. House & Outbuildings Site # 635	ca. 1885	N side of County Rd. 56, 3/4 mi. E of SC 560
Ida R. Harris House Site # 712 <i>ruins</i>	ca. 1910	N side of County Rd. 97, 1.5 mi. E of junction with County Rd. 272
Isaac Herbert Boulware Place Site # 664	1884	W side of SC 395, 6.5 mi. SW of the City of Newberry
Ivy Clark Abrams House Site # 641	ca. 1840	S side of County Rd. 56, 1 mi. W of intersection with County Rd. 277
J. Cal Cook House Site # 328	1888	County Rd. 226, on unimproved road N of County Rd. 408
J. Monroe Wicker House Site # 710	ca. 1840	W side of County Rd. 97 at intersection with County Rd. 98
J. William Smith House Site # 636 fair	ca. 1890	S side of County Rd. 56, 1.5 mi. E of SC 560
J.B. Scurry House Site # 610	ca. 1850	W side SC 39 at junction with SC 56
J.L. Koon House Site # 708	ca, 1910	W side of County Rd. 272, at intersection with County Rd. 97
Jacob Wicker House Site # 669	1882	N side SC 34, 1.5 mi. E of County Rd. 55
James Pressley Boozer House & Store Site # 604 fair	ca, 1895	N side of County Rd. 65, 2 mi. NW of junction with SC 56
James Wicker House Site # 677	1915	E side of US 176, NE of intersection with County Rd. 499
Jim Counts House Site # 252	1855	US 176, 4 mi. E of Pomaria
Jim Ruff House I Site # 688 <i>fair</i>	ca. 1890	S side SC 219, .5 mi. SE of junction with County Rd. 499
Jim Ruff II House & Delco Battery House	1923	SW intersection of SC 219 & County Rd. 499

Site # 687		
Joe Boland House & Outbuildings Site # 384	ca. 1840	N side of County Rd. 515, 2 mi. E of County Rds. 211 & 405
Joe Dowd House Site # 593	ca. 1895	S side of US 76, 2 mi. W of Little Mountain
Joe Koon House Site # 733	ca. 1917	SW side of SC 219, 1/4 mi. NW of intersection with County Rd. 99
John William Summer Hoüse Site #408 fair	1860	S side of County Rd. 33, 2 mi. W of County Rd. 28
John Adam Boland Sr. House & Outbuildings Site # 388	1830s, 1920s	N side of dirt road, parallel to US 76, .8 mi. W of Little Mountain
John Boland I House, Smokehouse Site # 377 poor	L- ca. 1790 R- ca. 1840	E side of County Rd. 271, 2 mi. NE of County Rd. 20
John C. Hipp House Site # 741	1903	E side of SC 395, immediately S of City of Newberry
John A. Werts House Site # 261	1871	N side of SC 34, 2 mi. W of Silverstreet
John Fulmer House, Drs. Offices, & Outbuildings Site # 410	ca. 1845	E side of US 176, 3/4 mi. SE of SC 213
John Hopkins Williams House Site # 618		E side of County Rd. 48, 1/4 mi. N of junction with County Rd. 30
John Lominick House Site # 678	ca. 1880	W side of US 176, 2 mi. NW of junction with SC 219
John Mayer House Site # 404	ca. 1890	E side of County Rd. 28, 2 mi. S of County Rd. 98
John Mayer House & Outbuildings Site #411	ca. 1858	N side of County Rd. 172, 1 mi. E of US 176
John Peterson House Site # 264	ca. 1830	S side of County Rd. 101, 25 mi. W of Silverstreet
John Sanders House Site # 285	ca. 1840	N side of dirt road, 2 mi. NE of junction of SC 34 & County Rd. 577
John Schumpert House Site # 275	ca. 1850	W side of SC 395, 5 mi. S of junction with County Rd. 83
John Shealy House Site # 393	ca. 1840	N side of County Rd. 25, 2 mi. E of intersection with County Rd. 24
John Spearman House Site # 262	1885	W side of County Rd. 49, S of County Rd. 343
John Stockman House Site # 337 dilapidated	ca. 1800	W side of County Rd. 71, .6 mi. S of County Rd. 197
John Stoughton Henderson House	ca. 1840	E side of dirt road, 1.2 mi. N of County Rds. 55 & 28

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Site # 600		
John Wicker House Site # 670	ca. 1830	S side of Sc 34, 1.5 mi. E of County Rd. 55
Johnston Log House Site # 644 fair	ca. 1800	E side of County Rd. 64, .2 mi. N of County Rd. 276
Jolly Street School Site # 694	ca. 1920	W side of County Rd. 99, 2 mi N of County Rd. 38
Kennerly House Site # 654	ca. 1910	N side of County Rd. 44, .2 mi. W of intersection with I-26
Kenny Fellers House Site # 341 poor	ca. 1810	SW quadrant of SC 391 & County Rd. 41
Kibler Log Cabin Site # 390 fair	ca. 1760	N side of County Rd. 164, .9 mi. E of intersection of SC 773 & I-26
Kibler House Site # 696		N side of 1-26, E of SC 773
Kinard House Site # 659 <i>fair</i>	1840	N side of County Rd. 44, 2.5 mi. E of I-26
Koon Boozer House & Outbuildings Site # 319 dilapidated	ca. 1780-1810	.8 mi. SE County Rd. 41
Lane House Site # 706 poor	ca. 1830	E side of County Rd. 351, .2 mi. E of junction with County Rd. 272
Lebanon Methodist Church Site # 657	1924	N side of County Rd. 44, 2 mi. E of I-26
Leonard Livingston House Site # 692	ca. 1910	S side of SC 219, 1.5 mi. W of County Rd. 299
Levi Stephen Wheeler House Site #		
Lindsay Fellars House Site # 340	ca. 1850	W side of County Rd. 391, 3 mi. SW of County Rd. 41
Lindsey Dominick Site # 277	ca. 1840	S side of County Rd. 83, 3 mi. SE of Silverstreet
Luther Shealy House Site # 597	ca. 1860	.4 mi. S of US 76, on W side of County Rd. 20
Luther Mayer House & Outbuildings Site # 401 poor	ca. 1880	.1 mi. N of intersection with SC 213 & County Rd. 28

Lyles House Site # 723 fair	before 1776	on County Rd. 54, N of its intersection with County Rd. 45 in Maybinton Section
M.W. Oxner & Sons Store Site # 621	1907	S side of US 76, immediately E of SC 560
Macedonia Lutheran Church Site # 348	1914	W side of County Rd., 3.1 mi. SE of County Rd. 340
Macedonia School Site # 348 fair	ca. 1910	E side of County Rd. 26, 1/4 mi. SE of County Rd. 313
Madison Pitts House Site # 295	ca. 1860	end of County Rd. 590
Maffett-Fant House Site # 263	ca. 1855	S side of US 34
Mangum-Satterwhite House Site # 640	ca. 1860	S side of County Rd. 56, 2 mi. E of junction with County Rd. 328
Marcus Lester House Site # 345 dilapidated	ca. 1895	W side of County Rd. 26, 1.5 mi. SW of County Rd. 72
Martin Wheeler House & Outbuildings Site # 379	1880	W side of County Rd. 20, 4 2 mi. S of Little Mountain
Mathis Hollingsworth House Site # 605 derelict	ca. 1910	N side of County Rd. 65, 3 mi. W of SC 56
Maxcey Hawkins House Site # 334	ca. 1830	W side of County Rd. 71, .5 mi. S of County Rd. 187
Mel Wicker House Site # 700 <i>fair</i>	ca.1885	E side of County Rd. 666, 1 mi. NE of junction with CS 219
Midway School Site # 722 demolished 1982	ca. 1935	E side of US 76, .1 mi. SE of City of Newberry
Mollihon Site# 52	ca. 1800	1.2 mi. SW of Whitmire, on E side of SC 66
Monts House Site # 395	L- ca. 1868 R ca. 1800	E side of SC 202, S of I-26
Moon-Dominick House Ref. # 82003896	1982*	NE of Chappells
Mrs. Essie Singley House Site # 592	ca. 1830	S side of US 76, near intersection with SC 773
Mrs. Haley Epting House Site # 445	1850 core	W side of County Rd. 167, 1 mi. SW of US 176

Mt. Bethel-Garmany School Site # 728 fair	1924-1925	N side of County Rd. 44, 1.5 mi. E of I-26
Mt. Olivet Lutheran Church Site # 332	1890	E side of County Rd. 71, 3/4 mi. S of County Rd. 408
Mt. Tabor Lutheran Church Parsonage Site # 598	1917	S side of County Rd. 24, .7 mi. E of junction with US 76
Murchison Bedenbaugh House Site # 327	1805, 1880	E side of County Rd. 226, at junction with SC 391
Nance House Site # 668	ca. 1855	N side of SC 34, E of intersection with US 176
Nathan Wheeler House Site # 383	ca. 1820	S side of County Rd. 72, 2 mi. E of County Rd. 24
Nathan Wheeler House fair	ca. 1915	W side of County Rd. 20 at junction with US 76
Neel House Site # 651 fair	ca. 1900	W side of County Rd. 48, immediately E of County Rd. 321
New Hope Methodist Church Site # 742	ca. 1880	N side of County Rd. 97, 3/4 mi. W of intersection with County Rd. 49
New Chapel Methodist Church Site # 276	ca. 1879	Rt. 4 Newberry, N side of County Rd. 83, 2 mi. SE of County Rd. 361
Newberry Farmhouse Site # 255	ca. 1800	W side of County Rd. 772, 2.1 mi S of US 76
Noah Moore House Site # 329	ca. 1830	E side of County Rd. 358, near intersection with County Rd. 587
Oakdale Site # 623	ca. 1855	N side of US 76, 1 mi. E of SC 560
Old Saluda Academy Site # 326 poor	ca. 1868	S of junction of SC 391 with County Rd. 226, 6 mi. S of Prosperity
Old Blair Place Farm Outbuildings Site # 278	ca. 1830 & 1900	W side of SC 121, S of Silverstreet
Ollie Sease House Site # 589 fair	са. 1860	S side of US 76, 2 mi. W of intersection with SC 391
Otis Kinard House & Outbuildings Site # 693	ca. 1890	W side of County Rd. 82, immediately W of intersection with County Rd. 38
Patrick Boland House & Outbuildings Site # 385 fair	ca. 1860	N side of County Rd. 515, .4 mi E of County Rds. 211 & 405
Paul Derrick House Site # 412 fair	ca. 1870	N side of County Rd. 172, 1.1 mi. E of US 176

Paysinger House	ca. 1790-1795	E side of dirt road, .5 mi S of County Rd. 257
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Paysinger-Lester House Site # 739	ca. 1915	E side of County Rd. 42, at intersection with SC 395
Petlus Lominick House Site # 660	ca. 1895	N side of County Rd. 44, 2 mi. W of US 176
Pinckney Clark Smith House Site # 646 fair	ca. 1909	E side of County Rd. 96, 2.5 mi. W of junction with County Rd. 56
Poteat Long House Site # 333		W side of County Rd. 71, .2 mi. SW of County Rd. 408
Rafe Boazman House & Outbuildings Site # 613 vacant, fair	ca. 1880	E side of SC 39, 1.4 mi. N of junction with SC 34
Ramage House Site # 291	ca. 1808	E side of County Rd. 66, opposite of County Rd. 273
Reederville School Site # 637 <i>poor</i>	ca. 1880	S side of dirt road, .5 mi. W of junction with County Rd. 56
Rev. T.S. Boinest House Site # 697	ca. 1845	W side of County Rd. 299, 1 mi. NE of junction with County Rd. 38
Rhude Metts House Site # 689 poor	ca. 1875	E side of County Rd. 99, 1.2 mi. SE of junction with SC 219
Richard Cornelius Workman House Site # 645 fair	1873	E side of Coutny Rd. 96, 1 mi. S of junction with SC 560
Rock House Site # 22	ca. 1758	4 mi. S of City of Newberry, N side of County Rd. 42 (Old Bush River Rd.)
Ruff Brothers Store (River Rd.) Site # 719 <i>fair</i>	1935	W side of County Rd. 28, immediately S of intersection with County Rd. 97
Ruff's Store Site # 686	1920	SW of intersection of County Rd. 499 & SC 219
Sam Werts House Site # 280	ca. 1800	S side of SC 34, between County Rds. 508 & 390
Samuel Rhude Metts House Site # 732	ca. 1900	N side of County Rd. 82, 2 mi. W of intersection with County Rd. 38
Sand Hills Farm Site # 650 demolished 1983	1840	N side of County Rd. 48, .1 mi. E of County Rd. 321
Schumpert-Cousins House Site # 287	ca. 1895	S side of County Rd. 43, 1 mi. E of SC 395
Sebern Stockman House Site # 342	ca. 1870	E side of County Rd. 26, .8 mi. SE of County Rd. 404

Sebyt House	ca. 1880	W side of SC 202, I mi. N of I-26
Sile # 270 juir	1.	
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Sharon Methodist Church Site # 622	1905	S side of US 76, E of County Rd. 56
Shelton Garrett House Site # 331	ca. 1850	E side of County Rd. 71, .2 mi. S of County Rd. 587
Silverstreet Cotton Gin Site # 294 <i>burned 1980</i>	1900	S side of SC 34
Site of Mudlick Creek Battle	March 2, 1781	
Smith Mercantile Company Site # 620 fair	1926	N side of US 76, immediately E of Sc 560
Smyrna Presbyterian Church Site # 730	1935	S side of County Rd. 58, & E of County Rd. 393
Sondley House & Store Site # 675	ca. 1850	W side of US 176, 1 mi. SE of junction with County Rd. 82
Spearman Hudson House Site # 274	ca. 1830	E side of Southern Railroad, near County Rd. 49
Spearman-Hudson House Site # 286	ca. 1840	.2 mi. W of County Rd. 343, on E side of County Rd. 40
St. Phillips School Site # 685	1930	N of SC 219, between County Rds. 82 & 666
St. Johns Lutheran Church	ca. 1754	on County Rd. 170, 1 mi. N of its intersection with U.S. 176
Stuck House Site # 695 <i>fair</i>	ca. 1900	W side of SC 773, 2 mi. E of I-26
Summer House Site # 399 poor	ca. 1866	W side of County Rd. 167, 1 mi. NE of 1-26
Summer-Hipp House Site # 400 fair	1813	W side of County Rd. 167, .4 mi. N of I-26
Summers-Smith House	1854	on S.C. Rt. 560 on Kinards Community
The Oaks Site # 731	ca. 1835	N side of County Rd. 58, 1/4 mi. E of Smyrna Presbyterian Church
Thomas Bauskett Wadlington House Site # 674 <i>fair</i>	ca. 1859	N side of SC 34, at intersection with US 176
Thomas Wilson Caldwell House Site # 672	ca. 1845	W side of US 176, 3/4 mi. N of junction with SC 34
Thompson Conner House Site # 624	ca. 1840	S side of US 76, 2.2 mi. W of Jalapa (intersection of County Rds. 342 & 32)
Thompson-Alewine House Site # 661	ca. 1830	E side of dirt road, near intersection with County Rd. 44

Tom Morris House Site # 322		SW of Prosperity, E side of County Rd. 231, 1.5 mi. S of County Rd. 41
Turner's Block House Site	ca. 1751	at the mouth of the Little River
Universalist Church Site # 681	ca. 1906	end of dirt rd., extension of County Rd. 611, 1.5 mi. S of junction with SC 219
W.A. Counts House Site # 595	cai 1915	E side of SC 202, .2 mi. N of Little Mountain
W.C. Moore Houses Site # 606	ca. 1885	E side of dirt road, parallel to SC 39, 3/4 mi. N of junction with County Rd. 345
W.D. Summer Store Site # 406	1918	N side of County Rd. 33, N of junction with County Rd. 170
W.E. Spearman, Jr. House Site # 611	1890-1920	E side of SC 39, .1 mi. S of junction with SC 56
W.P. Bozhardt House Site # 288	ca. 1840	E side of SC 395, 1 mi. S of County Rd. 315
W.R. Keith House Site # 612	ca. 1910	E side of SC 39, 2 mi. N of Chappells
Wade Setzler House Site # 711 1984 Tornado	1855	W side of County Rd. 272, at junction with County Rd. 97
Walter Franklin Ruff House Site # 684	ca. 1880	S side of SC 219, .1 mi. N of County Rd. 499
Warner House Site # 343 poor	ca. 1810	W side of County Rd. 26, at intersection with County Rd. 72
Warren Epting Home Site # 407	ca. 1890	N side of County Rd. 33, 2 mi. W of County Rd. 28
Washington Suber House Site # 268	ca. 1870	N side of SC 34, 2 1/4 mi. W of Silverstreet
Washington Floyd House Site # 648	ca. 1840	N side of County Rd. 58 (Belfast Rd.), E of County Rd. 64
Werber House Site # 289	1847	W side of SC 395, 5 mi. S of City of Newberry
Werts House Site # 735 poor	L-1820 R-1850	3/4 mi. S of County Rd. 360, on E side of County Rd. 28, at end of dirt road
Wessinger-Earle House Site # 402 ruins	ca. 1850	E side of County Rd. 28, 1 mi. N of SC 213
Wheelan School Site # 382	ca. 1912	S side of County Rd. 72, 1 mi. W of County Rd. 20
Will Whitney House Site # 726	ca. 1830	E side of County Rd. 45 at intersection with County Rd. 54
Will Miller House (Dickert Miller) Site # 403	ca. 1780	E side of County Rd. 28, 2 mi. NW of SC 213



Will George House & Outbuildings Site # 389	ca. 1910	S side of US 76, at junction with County Rd. 164
William Glenn Mayes House Site # 634	ca. 1830	E side of County Rd. 81, 1/4 mi. N of SC 121
William D. Reagin House Site # 737	ca. 1840	S side of County Rd. 343, 1/4 mi. W of intersection with SC 121
Windy Hill Site # 253	ca. 1870	E side of SC 773, 1 mi. S of junction with US 176
Wyche-Meetze House Site # 381	ca. 1870	S side of County Rd. 72, 1/8 mi. W of County Rd. 20
Zion Baptist Church Site # 256	ca. 1865	off of County Rd. 101, near SC 34
Chappell-Holloway House Site # 616 poor	1879 ·	E side SC 39, .1 mi. W of junction with SC 34
Chappells School Site # 615	1937	E side SC 39, .7 mi. N of intersection with SC 34
Charles (Karl) Krauser House Site # 270	ca. 1840	E side County Rd. 376, 2 mi. S County Rd. 22
Ellerby Sease House Site # 656	ca. 1905	N side County Rd. County Rd. 44, 1 mi. E of I-26

#### Important Archaeological Sites

Within Newberry County, there are 494 known archaeological sites. Over sixty percent of these are located in the Sumter National Forest, and as a result, they cannot be listed for purposes of protecting them. A variety of site sizes are included in the 494- they range from having only two to four artifacts to significant sites that are listed on the National Register of Historic Places.

#### Unique Commercial and Recreational Areas

See the sections about each municipality for detailed descriptions of unique commercial and recreational areas in the county.

#### Unique Scenic and Natural Areas

#### Lake Murray

The lake is named after William Murray, the engineer who, with his partner T.C. Williams, conceived and persevered until the Aworld-s largest earthen dam<sup>2</sup> at the time was finished. Their vision of harnessing hydroelectric power here and at the Santee Cooper project brought abundant electricity to the middle part of South Carolina. Work on the dam

across the Saluda River was started on September 21, 1927 and was finished on June 30, 1930.

The dam itself was built over 200 feet tall. It runs a distance of a mile and a half across. The ground level of the dam is over a quarter of a mile thick. The lake it forms is forty-one miles long and, in places, over fourteen miles wide. State Highway 6 runs along the top of the dam, giving a panoramic view of the water on one side and the layout of the SCE&G Power Plant below.

The lake has over 500 miles of shoreline, and forms an impoundment of over 50,000 acres. To make the building of the lake possible, more than 100 tracts of land were acquired, and 5,000 people:s homes were relocated.<sup>1</sup>

#### **Dreher Island State Park**

Dreher Island State Park is located on Lake Murray just 17 miles southeast of the City of Newberry. During the 1940's, the area was used by the Army Air Corps. Today the park consists of 3 islands linked to the mainland by a causeway and two bridges. There is 348-acres and 12 miles of shoreline in the park. Overnight amenities include 5 lakeside island villas, 112 campsites beside Lake Murray and a primitive camping area for organized groups. Day-use facilities include: park store/tackle shop; fishing; boating; 14 picnic shelters, and a screened shelter for meetings.<sup>2</sup>

#### Lake Greenwood

Lake Greenwood is categorized as a major lake and has a watershed covering 772.1 square miles . The lake has a surface area of 11,400.5 acres, and a maximum and mean depth of 68.9 feet and 23 feet, respectively. Fishing and boating are supported by the lake. Lake Greenwood State Park is located in Greenwood County.

#### **Sumter National Forest**

Sumter National Forest is located in northern Newberry County, and its area consists of about 55,505 acres. It offers diverse plant, wildlife, and forest communities. See the Natural Resources element for a list of the facilities in the national forest.

#### Peak Natural Area

<sup>2</sup> Http://www.southcarolinaparks.com/dreherisland.htm

<sup>&</sup>lt;sup>1</sup> Http://www.lakemurray.com/history/htm

Located north of Chapin, just inside the Newberry county line near Crim Creek, Peak Natural Area is between fifteen and thirty acres in area. Within this area are unique plant communities and forest stands.

#### **Broad River Scenic Area**

This area lies in northeast Newberry County, facing Henderson's Island. The Broad River Scenic Area consists of fifty acres and offers scenery with diverse plant and wildlife communities.

#### Horseshoe Bend

Located near Foster's Creek along the Enoree River, Horseshoe Bend is an are of three hundred acres. It offers scenic views and a primitive natural area.

#### Education, Religious, or Entertainment Areas or Institutions

See the sections about each municipality for detailed descriptions of the education, religious and entertainment areas and institutions in the county.

#### **Festivals**

See the sections about each municipality for detailed descriptions of the festivals in the county.

#### 2. Needs and Goals

The needs related to the cultural resources element revolve around continuing to preserve and promote the historic, natural, and scenic resources of the county. For example, only one of the sites listed in Table C-1 is on the National Register of Historic Places. Additionally, the South Carolina Department of Archives and History has not conducted a comprehensive survey of the county. Significant efforts have been taken to preserve the scenic and natural beauty of the county, but as development occurs, a greater commitment will have to be made.

<u>Goal for Newberry County</u>: The goal for the Cultural Resources element is to continue to recognize the importance of the historic and cultural resources in the policies, plans and ordinances of the county to insure that the unique character of the county is preserved and enhanced.

#### 3. Implementation Strategies and Time Frames.

Implementation strategies and time frames for achieving the cultural resources element goals are included in Chapter Eight of this Comprehensive Plan.

#### B. Town of Peak

1. Inventory

#### Historical Background -Town of Peak

The grading of the Columbia and Greenville railroad line, from Columbia to Broad River Bridge at Alston, was completed in July 1850. The bridge was finished that October, and the railroad reached Newberry in March 1851. Peak Station (incorporated in 1839) was named after H.T. Peak, the superintendent of the road.

#### Historic Sites and Structures

The following table lists the historic sites and structures for the Town of Peak. The information was collected from four sources: The National Register of Historic Places; <u>The Consolidated</u> <u>Inventory of Regional Natural Resources and Infrastructure</u>, prepared in June 1996 by Central Midlands Regional Planning Council; the <u>Central Midlands Historic Preservation Survey</u> prepared in 1974 by Central Midlands Regional Planning Council, and a survey conducted in the mid 1980's by Nancy Fox for the S.C. Department of Archives and History.

HISTORIC SITES	AND STRUCTURES	IN AND NI	CAR THE TOWN OF PEAK

**TABLE C-2** 

Sites and Structures	Year	Location
B. F. Sweetenberg House	c. 1892	East Side County Rd. 28; 3 blocks south of Post Office
438		
Henry Suber Cotton Warehouse	c. 1895	North Side County Rd. 28, South of Southern Rail
429		Road
J. K. Summer House	c. 1880	West Side County Rd. 28; 1 mile south of Peak
442		
Richmand and Danville RR Sections	c. 1907	East Side County Rd. 28; S.E. of Peak Town Square
Master's House		
434		
Swygert Brothers' Store	c. 1855	North east town square
430		
Swygert House	c. 1880	East Side County Rd. 28; 6 miles south of Peak
443		

Willie Wilson House	c. 1870	West side County Rd. 28; 2 blocks south of Post
437		Office

#### Important Archaeological Sites

Within Newberry County, there are 494 known archaeological sites. Over sixty percent of these are located in the Sumter National Forest, and as a result, they cannot be listed for purposes of protecting them. A variety of site sizes are included in the 494- they range from having only two to four artifacts to significant sites that are listed on the National Register of Historic Places.

#### Unique Commercial or Residential Areas

The town has not identified unique commercial or residential areas within the town

limits.

## Unique Natural and Scenic Areas

There are no unique scenic or recreational areas identified in the town.

#### **Festivals**

There are no festivals held within the town.

#### 2. Needs and Goals.

There are no cultural resources located in the town, despite its location on the Broad River. Declining opportunities such as the request to allow the Palmetto Trail to pass through the town indicates a lack of interest by the town to preserve and display its natural and historic features. The Palmetto Trail project will link the coast with the mountains with a hiking trail that will pass through several historic and scenic sites. Failure to embrace such opportunities coupled with the decline in population may result in Peak suffering the same fate as Chappells.

<u>Goal for the Town of Peak</u>: The Cultural Resources goal for the Town of Peak is to begin efforts to identify, preserve and protect the historic, natural and scenic resources in the town.

#### 3. Implementation Strategies and Time Frames.

Implementation strategies and time frames for achieving the cultural resources element goals are included in Chapter Eight of this Comprehensive Plan.

- C. Town of Pomaria
- 1. Inventory

#### Historical Background - Town of Pomaria

The grading of the Columbia and Greenville railroad line, from Columbia to Broad River Bridge at Alston, was completed in July 1850. The bridge was finished that October, and the road reached Newberry in March 1851. The Town of Pomaria was named for the plantation of William Summer located about mile and half away

### Historic Sites and Structures

Table C-3 lists the historic sites and structures associated with the Town of Pomaria. The information was collected from four sources: The National Register of Historic Places; <u>The Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, prepared in June 1996 by Central Midlands Regional Planning Council; the <u>Central Midlands Historic Preservation Survey</u> prepared in 1974 by Central Midlands Regional Planning Council, and a survey conducted in the mid 1980's by Nancy Fox for the S.C. Department of Archives and History... Dates with an \* next to them indicate the date that the item was listed on the National Register of Historic Places.

# TABLE C-3 HISTORIC SITES AND STRUCTURES IN AND NEAR THE TOWN OF POMARIA

Sites and Structures	Year	Location
Folk-Holloway House Ref.# 92000963	1992*	corner of Holloway (Rt.107) & Folk St.
Hatton House Ref.# 90001504	1990*	Holloway St., between Folk St. and U.S. 176
Lutheran Theological Southern Seminary Site	1830	on Hwy 176, 1 mi. W of Pomaria
Pomaria Ref.# 79003321	1979*	SE of Pomaria on U.S. 176
Pomaria Nurseries	c.1840-1880	Pomaria
St. John's Lutheran Church Ref.# 78002527	1978*	SE of Pornaria
St. Paul's Evangelical Lutheran Church	c. 1761	Pomaria
Summer-Huggins House	c.1825	off County Rd. 170, 1 mi. N of U.S. 176 between Pomaria and Peak
Dr. Joel A. Berly House and Office 250	c. 1857	South Side of SC 107
Glymph's Store 419	c. 1918	East Side of Victoria
H. W. Lominack Store 418	c. 1918	East Side Victoria



Hentz Wicker House	1845	County Rd. 272, West Side 1 mile junction County Rd. 97
254		
Hetten Fields House	c. 1892	SC Highway 33
248		
John Hentz House	c. 1905	East Side of County Rd. 107
421		
Pomaria Oil Mill and Ginnery	c. 1914	East Side County Rd. 107, North of Main St.
420		
Pomaria Grade School	1913	East Side County Rd. 33, North East of County Rd. 107
423		
Pomaria Pharmacy/Bank of Pomaria	c. 1911	West Side of Victoria
416		
R. W. Hipp House	c. 1825	South of Intersection SC 773 and US 176
424		
R. H. Hipp General Store	c. 1918	South East corner Victoria
419		
Setzler Company	c. 1910	East Side of Victoria
415		
Setzler Hotel	1916	East Side of County Rd. 107
422		
Summer-Huggins House	c. 1825	Route 2, Box 11 Pomaria vicinity
Thomas E. Hentz Dry Goods	c. 1918	South West corner Victoria
414		· · · · · · · · · · · · · · · · · · ·
Wilson's Grocery	1926	East Side Victoria St.
417		

#### Important Archaeological Sites

Within Newberry County, there are 494 known archaeological sites. Over sixty percent of these are located in the Sumter National Forest, and as a result, they cannot be listed for purposes of protecting them. A variety of site sizes are included in the 494- they range from having only two to four artifacts to significant sites that are listed on the National Register of Historic Places.

#### Unique Commercial or Residential Areas

The town has not identified any commercial or residential areas within the town limits.

# Unique Natural or Scenic Areas

There are no scenic or recreational areas identified in the town.

### Education. Religious or Entertainment Institutions

There are no education, religious or entertainment institutions identified in the town.

#### **Festivals**

There are no festivals held in the town.

#### 2. Needs and Goals

As Table C-2 indicates, several historical sites have been identified in or near the town. Half of these sites are listed on the National Register of Historical Places. Two of these sites are located near each other, so it may be possible to use these sites as the beginning of a historic district.

<u>Goal for the Town of Pomaria</u>: The cultural resources goal is to continue the efforts to identify and preserve historic sites in the town. To highlight these historic sites, the town should consider the possibility of starting a festival as a means to attract visitors to the town.

#### 3. Implementation Strategies and Time Frames.

Implementation strategies and time frames for achieving the cultural resources element goals are included in Chapter Eight of this Comprehensive Plan.

#### D.. Town of Prosperity

1. Inventory

#### Historic Background - Town of Prosperity

The Town of Prosperity is located approximately five miles south-east of the City of Newberry. Settlement of the Piedmont region of South Carolina proceeded rapidly during the middle decades of the 1700's. In Newberry County, which was the west-central part of the state, Lutheran Germans were the first settlers. Among the several population concentrations in the county was Frog Level (changed to Prosperity in 1873). The completion of the railroad gave the new town permanency and gradually stimulated growth. By 1890, the town's inhabitants numbered 565 and by 1910 totaled 737. Successive agricultural booms and busts, coupled with rural out-migration in South Carolina as well as Newberry County, produced minor population fluctuations, as evidence by a 1970 town population of 762 persons. The town-s establishment of several churches is indicative of the fact that the citizens led a vigorously religious life. The community of Frog Level evidenced a concern with education, establishing the first school in 1831. By 1854, three schools were operating. In the early days of the town there was a particularly strong mercantile business. Stemming from the fact that there was a strong business community, the town was blessed by an adequate number of professionals
including physicians. The establishment of several Clubs indicates that the town has a healthy social history. The first literary club was established in 1903. The major portion of the social activity took place in the beautiful and spacious homes of historical significance of the early citizens.

## Historic Sites and Structures

Table C-4 lists the historic sites and structures associated with the Town of Prosperity. The information was collected from four sources: The National Register of Historic Places; <u>The Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, prepared in June 1996 by Central Midlands Regional Planning Council; and the <u>Central Midlands Historic</u> <u>Preservation Survey prepared in 1974 by Central Midlands Regional Planning Council</u>, and a survey conducted in the mid 1980's by Nancy Fox for the S.C. Department of Archives and History.

Sites and Structures	Year	Location	
Site # 352 demolished 1982	ca. 1900	W side of SC 391, 1.4 mi. S of Prosperity	
Site # 473	ca. 1870	left side of Dominick St.	
Site # 474	ca. 1880	228 Dominick St.	
Site # 475	ca. 1900	223 Dominick St.	
Site # <u>484</u>	ca. 1930	222 Etm St.	
Site # 488	ca. 1870	Rt. 3 (Elm St. Extension)	
Site # 489	ca. 1915	.1 mi. S of Elm St., E of town near RR	
Site # 491	ca. 1930	115 Grace St.	
Site # 498	ca. 1850	201 Long St.	
Site # 499	ca. 1860	304 Long St.	
Site # 502	ca. 1810	310 N. Main St.	
Site # 504	ca. 1910	301 N. Main St.	
Site # 506	ca. 1920	215 N. Main St.	
Site # 513 1905		117 N. Main St.	
Site # 518	1935	141 S. Main St.	
Site # 525	ca. 1923	214 S. Main St.	
Site # 532	ca. 1900	416 S. Main St.	
Site # 536	ca. 1870	602 S. Main St.	
Site # 538	ca. 1890	114 Pine St.	
Site # 539	ca. 1900	116 Pine St.	

TABLE C-4

## HISTORIC SITES AND STRUCTURES IN AND NEAR THE TOWN OF PROSPERITY

Site # 540	ca. 1890	118 Pine St.
A.H. Kohn House Site # 450	ca. 1884	115 Brown St.
Alan Hamm House Site # 530	ca. 1910	413-415 S. Main St.
Andrew Kinard House Site # 505	ca. 1915	222 N. Main St.
Arthur Kohn General Store Site # 515	1884	101 N. Main St.
B.B. Schumpert & Company Site # 514	ca. 1911	105-109 N. Main St.
B.B. Schumpert House Site # 507	ca. 1903	210 N. Main St.
Bank of Commerce Site # 516	1920	134 S. Main St.
Bank of Prosperity Site # 511	1905	125 N. Main St.
Bascom Hair House Site # 496	ca. 1910	201 Grace St.
Birge-Wise Hotel Site # 446	1850	Main St.
Bonnie Wise House Site # 453	1898	152 Brown St.
C.F. Sauer House Site # 468	ca. 1900	129 Church St.
Dewy Byrd House Site # 458	ca. 1915	107 Byrd St.
Dr. Joe Freed House Site # 479	ca. 1900	202 Elm St.
Dr. J.O. Simpson House Site # 472	ca. 1910	119 DeWalt St.
Dr. R.L. Luther House Site # 535	1882	524 S. Main St
Dr. J.S. Wheeler House Site # 447 front only remains	1898	1671 Main St.
Dr. A.F. Langford House Site # 503	ca. 1870	303 N. Main St.
Dr. W.T. McFall House Site # 451	ca. 1900	143 Brown St.
Dr. George W. Harmon, Dentist Site # 509	ca. 1919	131 N. Main St.
Eldridge Connelly House	ca. 1900	109 DeWalt St.

Site # 469		
Fair Home	19th century	2 mi. NW of Prosperity, off U.S. 76
Farmers Ice & Fuel Company Site # 477	1934	115 Elm St.
G.M. Able House Site # 461	ca. 1895	116 Byrd St.
G.W. Counts Pure Oil Station Site # 476	ca. 1935	101 Elm St.
Gary Dominick House Site # 467	ca. 1910	121 Church St.
George D. Brown House Site # 449	ca. 1879	W side of Brown St., 1.4 mi. S of Main St.
H.C. Moseley House Site # 456	1880	E side of Brown St. 1.4 mi. S of Main St.
H.E. Counts Garage Site # 510	1905	129 N. Main St.
H.P. Wicker House Site # 537	ca. 1930.	424 S. Main St.
Hamiter Log Cabin AC# 247	ca. 1800-1820	between dirt road to the S & Hwy. 575 to the N, NE of Providence AME Church, E side of dirt road
Harmon Tenant House Site # 500	ca. 1840	next to 304 Long St.
Horace Shealy House Site # 462	ca. 1930	111 Byrd St.
J. Moody Bedenbaugh House Site # 454	1919	153 Brown St.
J. Walter Stockman Site # 531	ca. 1910	413-415 S. Main St.
J.W. Bowers House Site # 481	ca. 1884	210 Ehm St.
James Wicker House Site # 455	ca. 1915	208 Brown St.
James Harman House Site # 463	ca. 1890	112 Byrd St.
Jane Reagan House Site # 486	ca. 1880	244 Elm St.
Jason Morris House Site # 464	ca. 1850	122 Byrd St.
Jeff Livingston House Site # 459	ca. 1898	108 Byrd St.
Joel Taylor House Site # 452	ca. 1900	148 Brown St.
John H. Dawkins House	ca. 1910	109 Byrd St.

Site # 460		
L.E. Long House Site # 478	ca. 1930	138 Elm St.
Lawson Wise House Site # 533	1915	432 S. Main St.
Lee Bowers House Site # 485	ca. 1874	236 Elm St.
LeRoy Pugh House Site # 470	ca. 1900	110 DeWalt St.
Major G.G. DeWalt House Site # 448 ruins	ca. 1870	end of DeWalt St.
Mark Bedenbaugh House Site # 466	ca. 1900	115 Church St.
Matthew P. Boozer Hosue Site # 529	ca. 1890	402 S. Main St.
Moseley Brothers Store Site # 492	1876	102 Grace St.
Noah L. Black Store Site # 527	ca. 1923	220-222 S. Main St.
Nu-Five & Ten Site # 526	ca. 1923	218 S. Main St.
O.W. Amick House Site # 457	ca. 1890	102 Byrd St.
Old Lutheran Parsonage Site # 482	ca. 1885	214 Elm St.
Old Crosson House Site # 487	ca. 1889	248 Elm St.
Old Methodist Church Site # 508	ca. 1881	202 N. Main St.
Old Prosperity Post Office Site # 512	1901	121 N. Main St.
P.E. Wise House Site # 501	ca. 1852	315 N. Main St.
Peoples National Bank Site # 494	ca. 1903	120 Grace St.
Prosperity AFM Lodge Site # 528	ca. 1923	202 S. Main St.
Prosperity Furniture Company Site # 517	1884	138 S. Main St.
R.W. Pugh House Site # 465	ca. 1910	106 Church St.
Shealy Motor Company Site # 490	ca. 1925-1928	101 Grace St.
Shealy-s Dry Goods	ca. 1923	210 S. Main St.

Site # 523		
Southern R.R. Depot Site # 497	1886	117 Grace St.
Stoney Battery	19th century	near intersection of S.C. 391 & County Rds.315 & 41, S of Prosperity
T.J. Kinard House Site # 471	ca. 1920	113 DeWalt St.
T.L. Schumpert House Site # 534	1894	429 S. Main St
W.E. Moseley Store Site # 519	ca. 1923	205 S. Main St.
W.E. Moseley Store Site # 522	ca. 1923	209 S. Main St.
W.E. Moseley Store Site # 495	ca. 1925	126 Grace St.
W.E. Moseley- Ruth Amick Store Site # 524	ca. 1923	211 S. Main St.
W.L. Mathis, Sr. Store Site # 521	ca. 1923	208 S. Main St.
W.W. Wheeler House Site # 480	ca. 1888	206 Elm St.
Wheeler & Moseley Store Site # 493	1870	108-114 Grace St.
103 Wye St. Site # 601	c. 1880	103 Wye St.
Alliance Cotton Warehouse Site # 587	c. 1900	114 Potato House Rd. (Wye St.)
Anna Dominick House Site # 565	c. 1892	SUI MCNEARY St.
B. D. Epting House Site # 572	c. 1910	522 McNeary St.
B. D. Hawkins House Site # 562	c. 1900	418 McNeary St.
Barnett Hare House Site # 542	c. 1900	122 Pine St.
Broad Street House Site # 599	c. 1895	
D. M. Langford House Site # 582	c. 1895	232 N. Wheeler Dr.
David H. Witherspoon House Site # 546	c. 1860	202 McNeary St.
Dr. C. T. Wyche House Site # 548	1890	208 McNeary St.
Dr. J. I. Bedenbaugh House Site # 560	c. 1910	405 McNeary St.
Dr. G.Y. Hunter House Site # 557	1890	324 McNeary St.

Ed. Counts House	c. 1890	506 McNeary St.
Site # 56/		
Ezra A. Counts House Site # 586	c. 1915	237 S. Wheeler St.
George Counts House	c. 1905	505 McNeary St.
Site # 566		
George Duncan House	c. 1886	525 McNeary St.
Site # 574		
Gregg Wise House	ca. 1910	218 Elm St.
Site # 483		
H. J. Leaphart House	c. 1920	317 McNeary St.
I Sile # 554	- 1909	201 MNi St
Site # 556	C. 1098	521 Micheary SL
Harold Epting House	c. 1898	414 McNeary St.
Site # 563	· · ·	
Hugh Fellers House	c. 1910	518 McNeary St.
Site # 570		
J. P. Bowers House	c. 1900	330 Wheeler St.
Site # 585		
Joseph H. Hunter House and Store	1892	302 N Wheeler Dr
Site # 583	1072	
Judith Shealy Taylor House	c 1935	North side of Southern Rail Road, West of Wye
Site # 504	0.1555	
Kibler House	1875	402 McNeary St
Site # 550	10/0	
I A Black House	c 1805	304 McNeary St
Site # 551	0.1095	504 MORCELY 51.
Long-Merchant House	0 1885	521 McNeary St
Site # 571	0.1000	SZI Michoaly Si
M C Morris House	C 1891	526 McNeary St
Site # 573	0.1091	SZO WORKdały Si
Mrs Mattie Orner House	c 1850	205 McNeggy St
Site # 552	0.1000	Sos Morroary St.
Old A RP Parsonage	c. 1900	410 McNeary St.
Site # 561		
Old Prognetity Isil	C 1910	118 McNeary St
Cita # 545	0.1710	A LO MONTORY OF
Old Fim St. House	a 1900	
Site # 602	0.1500	
Old Potato House	0 1920	128 Wye St (Old Potato House Pd)
	0. 1920	120 Wye Sh (Old I Vizio House Ku.)
Old Deservity Wish School	1026	Sahaal Drive
Site # 577	1720	
Prosperity Water Pump House	c. 1935	McNeary St., north of Town Hall
Site # 543		
Prosperity ARP Church	c. 1889	302 McNeary St.
Site # 550		
Prosperity Grade School	c. 1905	250 School Drive
Site # 576		



Prosperity Cotton Oil Company Mill	1905	McNeary St.
and Office	1	
Site # 547		
Prosperity Town Hall	c. 1905	116 McNeary St.
Site # 544		
S. B. Hawkins House	1900	401 McNeary St.
Site # 558		
Shell House	c. 1900	225 McNeary St.
Site # 549		
Shiloh AME Church	1920	425 Shiloh St.
Site # 580		
Sid Duncan House	c. 1915	509 McNeary St.
Site # 568		
Sim Mathis House	c. 1910	South Side of McNeary St., 4 miles east of Long St.
Site # 575		
W. L. Mathis House	c. 1915	417 McNeary St.
Site # 564		
W. C. Dominick House	c. 1900	513 McNeary St.
Site # 569		
W. H. Leaphart House	c. 1920	313 McNeary St.
Site # 553		· · · · · _ ·
W. A. Moseley Tenant House	c. 1900	Wye St.
Site # 600		
W.E. Moseley Store	ca. 1923	207 S. Main St.
Site # 520	1	
Waldo Lowman House	1892	306 N. Wheeler Dr.
Site # 584		
Walter Toland House	c. 1900	120 Pine St.
Site # 541		

## Important Archaeological Sites

Within Newberry County, there are 494 known archaeological sites. Over sixty percent of these are located in the Sumter National Forest, and as a result, they cannot be listed for purposes of protecting them. A variety of site sizes are included in the 494- they range from having only two to four artifacts to significant sites that are listed on the National Register of Historic Places.

## Unique Commercial or Residential Areas

The town has not identified any commercial or residential areas within the town limits.

## Unique Natural or Scenic Areas

There are no scenic or recreational areas identified in the town.

## Education, Religious or Entertainment Institutions

There are no education, religious or entertainment institutions identified in the town.

## <u>Festivals</u>

There are no festivals held in the town.

## 2. Needs and Goals

Despite a history dating back to the 1700's, there are no historic sites in town listed in Table C-3. Additionally, despite the growth in its economy and as an appealing place to live for commuters, there are no significant cultural resources identified in the town. A wide range of cultural resources is necessary for a well-balanced livable community.

<u>Goals for the Town of Prosperity</u>: The Cultural Resources goals for the Town of Prosperity are to identify and preserve historic sites and structures in the town. Additionally, the town should identify cultural resources desired by the residents and begin the process of meeting those desires.

#### 3. Implementation Strategies and Time Frames.

Implementation strategies and time frames for achieving the cultural resources element goals are included in Chapter Eight of this Comprehensive Plan.

#### E. Town of Silverstreet

#### 1. Inventory

#### Historical Background - Town of Silverstreet

The grading of the Columbia and Greenville railroad line, from Columbia to Broad River Bridge at Alston, was completed in July 1850. The bridge was finished that October, and the road reached Newberry in March 1851. The Village of Peak, named after H.T. Peak, the superintendent of the road; Pomaria, named for the plantation of William Summer located about mile and half away, were stations below the City of Newberry. The Town of Silverstreet was named after a carriage manufacturing business "Silverstreet Carriage Manufactory", located near Shop Springs Post Office, eight miles west of Newberry.

## Historic Sites and Structures

Table C-5 lists the historic sites and structures associated with the Town of Silverstreet. The information was collected from four sources: The National Register of Historic Places; <u>The Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, prepared in June 1996 by Central Midlands Regional Planning Council, and the <u>Central Midlands Historic</u> <u>Preservation Survey</u> prepared in 1974 by Central Midlands Regional Planning Council, and a survey conducted in the mid 1980's by Nancy Fox for the S.C. Department of Archives and History.

# TABLE C-5 HISTORIC SITES AND STRUCTURES IN AND NEAR THE TOWN OF SILVERSTREET

Sites and Structures	Year		Location
Saluda Old Town Site	pre-Co	lonial	5 mi. SE of Silverstreet, on the
			Saluda River

## Important Archaeological Sites

Within Newberry County, there are 494 known archaeological sites. Over sixty percent of these are located in the Sumter National Forest, and as a result, they cannot be listed for purposes of protecting them. A variety of site sizes are included in the 494- they range from having only two to four artifacts to significant sites that are listed on the National Register of Historic Places.

## Unique Commercial or Residential Areas

The town has not identified any commercial or residential areas within the town limits.

#### Unique Natural or Scenic Areas

There are no scenic or recreational areas identified in the town.

#### Education, Religious or Entertainment Institutions

There are no education, religious or entertainment institutions identified in the town.

## <u>Festivals</u>

There are no festivals held in the town.

## 2. Needs and Goals

The cultural needs of the residents easily can be met by the resources available in the region. However, the history in the town is unique to the town and should be preserved. The one item listed in Table C-4 is not located in the town. So it is likely that historic sites and structures in the town have not been identified or protected.

<u>Goal for the Town of Silverstreet</u>: A Cultural Resources goal for the Town of Silverstreet is to identify and preserve historic sites and structures in the town.

## 3. Implementation Strategies and Time Frames.

Implementation strategies and time frames for achieving the cultural resources element goals are included in Chapter Eight of this Comprehensive Plan.

## F. Town of Whitmire

## 1. Inventory

## Historical Background - Town of Whitmire

The Town of Whitmire is located in the Sumter National Forest, approximately 15 miles from the City of Newberry. The area was first settled by colonists of German heritage. These colonists settled at the intersection of Old Charleston and Ninety-Six Roads. The Whitmire area contained only a handful of people and a small, crossroads settlement until 1890, when the Georgia, Carolina and Northern Railroad built a rail line through the area. On December 18, 1891, the Town of Whitmire was established. The original town boundary was a circle of onehalf mile radius from the railroad depot. The building of the Glenn-Lowry Cotton Mill which was later sold, encouraged the economy as well as the population of the town after World War I.

## Historic Sites and Structures

Table C-6 lists the historic sites and structures associated with the Town of Whitmire. The information was collected from four sources: The National Register of Historic Places; <u>The Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, prepared in June 1996 by Central Midlands Regional Planning Council; and the <u>Central Midlands Historic</u> <u>Preservation Survey</u> prepared in 1974 by Central Midlands Regional Planning Council, and a survey conducted in the mid 1980's by Nancy Fox for the S.C. Department of Archives and



History. Dates with an \* next to them indicate the date that the item was listed on the National Register of Historic Places.

# TABLE C-6

# HISTORIC SITES AND STRUCTURES IN AND NEAR THE TOWN OF WHITMIRE

Sites and Structures	Year	Location
Drucilla Whitmire Museum		Whitmire community, no longer exists
Jasper Hall	c.1858	125 Colonial Drive
Mollohon	1790-1795	on S.C. Rt. 66, 1 mi. S of Whitmire
Pennington's Fort Site	1760	on Enoree River, 3 mi. below Whitmire
Abrams-Cooper Store 297	1917	Main Street
B. F. Marrow Hotel Survey #311	1917	101 Main St.
Baker Candy Store Survey #298	1920	Main St.
Bank of Whitmire Survey #299	c.1895	Main St.
Berkowitz-Simpson Store Survey #300	1917	108 Main St.
C. B. Jeter Building Survey #309	c. 1935	Main St.
David Duncan House Survey #305	1903	315 N. Church St.
Dr. George Douglas House Survey # 303	c. 1905-06	110 Glenn St.
Dr. Francis F. Calmes House Survey #315	c. 1832	North of S.C. 66 East of Laurens-Newberry Line 5 miles Southwest of Whitmire
Duncan Bldg. Survey # 304	1917	106 Main St.
Glenn-Lowry Mill Superintendent's House Survey #308	c. 1903	300 Glenn St.
John P. Fant House Survey #307	c. 1898	116 Railroad Ave.
John P. Fant Cottage Survey # 306	c. 1904	113 N. Main St.
Miller Brother Store Survey #310	1917	Main St.
P. B. O'Dell's Garage and Ford Auto Survey #312	c. 1920	S. E. Corner of Church St. and Railroad Ave. Burned in the 1970's, Current site of L'il Cricket store
Raso-Young Bros. Store Survey #313	c. 1915	115 Main St.
Whitmire Plant/James Games/Post Office Survey #315	c. 1950	Main St.

Whitmire Methodist Episcopal Church Survey # 314	1920	Comer of Glenn and Church St.
Whitmire Presbyterian Church 316	1908	Corner and Union and Church St.
Whitmire Town Hall Survey #317	c. 1922	Northwest corner Main and Gillian St.
William Coleman Bldg. Survey #301	1905	325 Main St.
William Coleman House Survey # 302	1902-03	Coleman St., Now Watson Street

#### Important Archaeological Sites

Within Newberry County, there are 494 known archaeological sites. Over sixty percent of these are located in the Sumter National Forest, and as a result, they cannot be listed for purposes of protecting them. A variety of site sizes are included in the 494- they range from having only two to four artifacts to significant sites that are listed on the National Register of Historic Places.

## Unique Commercial and Residential Areas

The town of Whitmire has a unique residential area known as Mill Village, which is divided into two parts. Part one is comprised of Central Ave., Grant Street, Reed Ave. 1, Emoree Street, Simms Street, Evans Street, Reed Ave. 2, Cole Ave., and Broom Street. Part two is comprised of Park Street, Glenn Street, Bridge Street, Gary Street, McDonald Street, half of Union Street, Union Street Extension, Lowry Street, Wood Street, Herron Ave., Washington Street, Sinclair Ave., and Spring Street. The area consists of homes that were originally built for the workers of the nearby mill, currently the Westpoint-Stevens Mill.

## Unique Natural or Scenic Areas

There are no scenic or recreational areas identified in the town, however, the town is located within Surnter National Forest, and is located between Duncan Creek and the Enoree River.

#### Education, Religious or Entertainment Institutions

There are no education, religious or entertainment institutions identified in the town.

## Festivals

Party in the Pines, sponsored by the Whitmire Jaycees, was started in 1987. The town closes Main Street for the festival which includes crafts, food, rides, races, and an entertainment stage. The festival last three days, and begins on the second Thursday in June.

- Needs and Goals: The needs related to historic and cultural resources revolve around continuing to preserve and promote the cultural and historic resources of the town.
   <u>Goals for the Town of Whitmire</u>: Cultural Resources goals include:
  - Identify and preserve additional historic sites and structures in the town
  - Implement policies designed to preserve the historic significance of the Mill Village.
  - Market the town as the a Gateway to the Sumter National Forest<sup>®</sup> and provide services to those visiting the forest.
- 3. Implementation Strategies and Time Frames.

Implementation strategies and time frames for achieving the cultural resources element goals are included in Chapter Eight of this Comprehensive Plan.

G. Town of Little Mountain

1. Inventory

#### Historical Background - Town of Little Mountain

The Town of Little Mountain is located in the southeastern portion of Newberry County about twelve miles from the City of Newberry. The area around Little Mountain was first settled in the 1750's as a part of the Orangeburg District and later as part of Lexington County. The Town itself was bisected by the first boundary between Newberry and Lexington Counties. The post office was established at Little Mountain in 1852. The Columbia, Newberry and Laurens Railroad began operation in 1890 and Little Mountain was the site of a depot. Other commercial buildings and residences followed. In 1890, the Town was incorporated, and when incorporated, was one mile square. In 1892, the legislature changed it to two miles square. It was returned to its 1890 limits in 1924.

#### Historic Sites and Structures

Table C-7 lists the historic sites and structures associated with the Town of Little Mountain. The information was collected from four sources: The National Register of Historic Places; <u>The</u> <u>Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, prepared in June 1996 by Central Midlands Regional Planning Council; and the <u>Central Midlands Historic</u> <u>Preservation Survey</u> prepared in 1974 by Central Midlands Regional Planning Council, and a survey conducted in the mid 1980's by Nancy Fox for the S.C. Department of Archives and History. Dates with an \* next to them indicate the date that the item was listed on the National Register of Historic Places.

# TABLE C-7

# HISTORIC SITES AND STRUCTURES IN AND NEAR THE TOWN OF LITTLE MOUNTAIN

Sites and Structures	Year	Location
Andrew Miller Store Site # 357	ca. 1895	E side of Depot St., ½ block S of Main St.
Ben Miller House Site # 364	ca. 1920	3rd house, E side Mountain St., 1 block S of US 76
Counts & Shealy Company Site # 360	1910	S side US 76 (Main St)
D.O. Frick House Site # 375	ca. 1910	2nd house W side Pomaria St. (SC 202)
Dominick Boland House, Well House Site # 354	ca. 1871	S side US 76, 1 block W of Mill St.
Dr. J.M. Sease House, Outbuilding Site # 372	1898	7th house W side Pomaria St. (SC 202), N of Main St.
Dr. J.M. Sease Office Site # 361	ca. 1915	S side of Main St.
Holy Trinity Evangelical Lutheran Church Site # 367	1917	N side Peak Rd. (County Rd. 39), 1 block E of Pomaria St. (SC 202)
J.B. Lathan House Site # 373	ca. 1905	6th house W side Pomaria St., N of Main St.
J.H. Wise Company General Store Site # 362	ca. 1909	SW corner of intersection of Pomaria and Main Sts.
John Boland House Site # 363	ca. 1910	E side Mountain St. (County Rd. 73), 1/2 block S of US 76
Judith Shealy Taylor House Site # 594		Little Mountain
Little Mountain		Newberry County
Little Mountain Masonic Hall Site # 359	ca. 1905	S side of Main St.
Little Mountain Oil & Fertilizer Company Site # 353	ca. 1900	N side Main St. (US 76), 1 block above Mill St.
Little Mountain Section House Site # 376	ca. 1890	NW corner of Main and Pomaria Sts.
Little Mountain School Site # 356	1909	S end of Mill St.



Luke Shealy House	ca. 1902	2nd house E side Pomaria St., N of Main St.
Site # 369	ł .	
		· · · ·
	· .	
· .		

Miller-Matthews House Site # 355	ca.1895	S side Main St., W of Mill St.
Rev. J.B. Wessinger Site # 374	ca. 1915	5th house W side Pomaria St., N of Main St.
Stockman House Site # 366	ca. 1840	S side County Rd. 99, 1/8 mi E of County Rd. 167
Thomas A. Brandy House Site # 368	ca. 1900	NE comer Pomaria & Church Sts.
W.A. (Will) Counts House Site # 370	1907	6th house from Main St., E side Pomaria St.
W.B. Shealy Site # 371	ca. 1910	W side Pomaria St., 8th house N of Main St.
W.P. Derrick General Stores Site # 358	ca. 1895	SE corner of Depot & Main Sts.

## Important Archaeological Sites

Within Newberry County, there are 494 known archaeological sites. Over sixty percent of these are located in the Sumter National Forest, and as a result, they cannot be listed for purposes of protecting them. A variety of site sizes are included in the 494- they range from having only two to four artifacts to significant sites that are listed on the National Register of Historic Places.

## Unique Commercial or Residential Areas

The town has not identified any commercial or residential areas within the town limits.

## Unique Natural or Scenic Areas

There are no scenic or recreational areas identified in the town.

## Education, Religious or Entertainment Institutions

There are no education, religious or entertainment institutions identified in the town.

## **Festivals**

Little Mountain Reunion is held on the first Saturday in August at Little Mountain Reunion Park and along Main St.

## 2. Needs and Goals

The needs related to historic and cultural resources revolve around continuing to preserve and promote the cultural and historic resources of the town.

Goal for the Town of Little Mountain: A Cultural Resources goal for the town is to identify and preserve historic sites and structures in the town.

## 3. Implementation Strategies and Time Frames.

Implementation strategies and time frames for achieving the cultural resources element goals are included in Chapter Eight of this Comprehensive Plan.

## H. City of Newberry

## 1. Inventory

## Historical Background - City of Newberry

The City of Newberry was established as the county seat in 1789. Both the commercial and political life of the village was controlled by a small contingent of professionals and merchants. During the 1820's it was these individuals who became the owners of nearby cotton plantations. With its position as a leading cotton market, Newberry quickly attracted a number of doctors, lawyers, and other professionals. The city however had no church for the first forty years of its existence. In 1831, the Baptists incorporated the first church. Newberry saw a great deal of growth during the nineteenth century because of its position as the state's cotton market, the advent of the railroad, the establishment of Newberry College, and the establishment of a textile factory in 1882. In 1832, Newberry citizens petitioned the General Assembly for incorporation as a town. Close to twenty years later, Newberry secured the first upstate railroad line in 1851, followed by the Laurens railroad in 1854.

## Historical Sites and Structures

Table C-8 lists the historic sites and structures associated with the City of Newberry. The<br/>information was collected from four sources: The National Register of Historic Places; The<br/>Consolidated Inventory of Regional Natural Resources and Infrastructure, prepared in June 1996<br/>by Central Midlands Regional Planning Council; and the Central MidlandsHistoric Preservation<br/>Historic PreservationSurvey, prepared in 1974 by Central Midlands Regional PlanningCouncil, and a survey

conducted in the mid 1980's by Nancy Fox for the S.C. Department of Archives and History. Dates with an \* next to them indicate the date that the item was listed on the National Register of Historic Places.

# TABLE C-8 HISTORIC SITES AND STRUCTURES IN AND NEAR THE CITY OF NEWBERRY

Sites and Structures	Year	Location
2305 Main St.	c. 1900	2305 Main St.
1728 Harns. St.	<b>c</b> . 1860	1728 Harns St.
926 Cline St.	c. 1870	926 Cline St.
1603 Calhoun St.	c. 1890	1603 Calhoun St.
1003 Wilson St.	1908	1003 Wilson St.
1203 Vincent St.	c. 1870	1203 Vincent St.
1601 Vincent St.	c. 1900	1600 Vincent St.
1903 Vincent St.	c. 1890	1903 Vincent St.
A.M. Bowers House NRMR B-24	c. 1875	820 Boundary St.
Accord House NRMR M-33	c. 1900	2000 Main St.
Alec Brown House	c. 1890	1600 Harrington St.
Altman Furniture NRMR A-6	c. 1907	1318 Main St.
A. M. Giradeau House Destroyed	c. 1875	1615 Vincent St.
ARP Parsonage NRMR M-48	1920	1206 Calhoun St.
Dr. Augustus Houseal House NRMR C-5	c. 1900	722 Caldwell
Aull House NRMR	1910	1212 Calhoun St.
Aveleigh Pres. Church NRMR50	1908	1209 Calhoun St.
A.W.T. Simmons House NRMR	c. 1880	1226 Calhoun St.
Ballinger Kyzer House	c. 1875-1880	608 O'Neal St.
Ben Anderson House	c. 1890	1523 Johnstone St.
Bethlehem Baptist Church NRMR -6	c. 1908	College St.
Black's Radio-TV	1907	1309 Main St.



NRMR A-4		
Boozer House	c.1860	1229 Calhoun St.
Boozer House NRMR-5	c. 1900	811 Pope St.
Boozer-Riggins House NRMR -40	c. 1905	2023 Main St.
Bothwell Graham House NRMR —19	c. 1895	1220 Calhoun St.
Boundary StNewberry Cotton Mills Historic District Ref.# 80004465	1980*	Drayton, Boundary, Charles, Terrant & Crosson St.
Boundary St. School Site	1890	1406 Boundary St.
Bowman House	c. 1880	2102 Johnstone St.
Brassy House NRMR 29	c. 1905	1113 Calhoun St.
Burr Ramage House NRMR30	c, 1860	1724 Main St.
Burton House Ref.# 80003681	1980 <del>*</del>	
Bush River Baptist Church Site	1771	Intersection of County Rds. 64 & 56, 10 mi. NW of Newberry
Bush River Quaker Site	1765-1812	on the Bush River, 3.5 mi. S of Newberry
Byrum House	c. 1897	2103 Johnstone St.
C.C. Cam Davis House NRMR C-6	1894	725 Caldwell St.
Caldwell-Higgins House Ref.# 80003682	c.1820	1520 Boundary St.
Caldwell-Lander House NRMR	c. 1900	2029 Main St.
Calvary United Presbyterian NRMR C-9	c. 1918	Caldwell St.
Carlisle Gift Shop NRMR A-3	1907	1307 Main St.
Chesley H. Cannon NRMR C-7	c. 1900	712 Caldwell St.
Clary House NRMR B-29	c. 1895	723Boundary St.
Caldwell St. Historic District Ref.# 80004464	.1980*	Caldwell St.
Central Methodist Church NRMR A-15	1901	1005 Caldwell St.
Chapman-Hawkins Company NRMR A-8	c. 1900	1319 Main St.
Charles C. Gray Home	1887	1228 Walnut St.
Charles Purcell House NRMR7	1910	1804 Main St.
Christian-Pearson-Neville	1850	1450 Calhoun St.

Coateswood Ref.# 75001704	c.1841	1700 Boundary St.
College St. Historic District Ref.# 80004461	1980*	College St.
Copeland House NRMR — 34	c. 1925	2004 Main St.
Coppock House	c. 1860	1503 Nance St.
Cousins House	1980*	Nance St. Extension
Ref.# 80004473	1000	
Dr. P.B. Ruff House	c.1853	808 Boundary St.
NRMR 10	c. 1870	1802 Harrington St.
Davis House NRMR –16	c. 1905	1621 College St.
Daniel Dewalt House NRMR —16	c. 1883	1217 Walnut St.
Dr. E.C. Jones House NRMR	c. 1890	1240 Calhoun St.
E. W. Thomason Cottage NRMR 11	1879	1808 Harrington St.
Eargle House NRMR 18	c. 1901	1611 College St.
Ebenezer Methodist Church Site	c.1814	Intersection of County Rds. 67 & 68 SE of Newberry
Dr. Edward Hipp House NRMR7	1910	1804 Main St.
Eleazer House NRMR	<b>c</b> . 1920	1223 Summer St.
Epting House NRMR B-28	c. 1900	714 Boundary St.
Ellesor House NRMR —6	c. 1890's	1737 Johnstone St.
Erasmus Nance House NRMR W-2	1840	SC 54
Ernest-Martin House NRMR –10	c. 1905	1817 College St.
Judge Eugene Blease House NRMR W-2	1935	519 Boundary St.
Evans-Dufford NRMR N-1	c. 1910	1900 College St.
Ewart House	c. 1900	2026 Johnsonte St.
Exchange Bank Building	1918	College and Main
NRMR A-2		
The Fashion	c. 1935	1312 Main St.
NRMR A-10		
Floyd House	1908	1103 Calhoon St.
Francis B. Wiggins House	1820	1520 Poundary St
NRMR 4 SC 44	C. 1020	
Gary House	c. 1870	808 O'Neal St.

NRMR B-17		
Gauntt House	c.1809	1316 College St.
Gildercrest	c.1857	921 Jessica Ave.
George Summer House NRMR C-4	1918	737 Caldwell St.
Goggins-Hollis House NRMR M-42	c. 1900	2003 Main St.
Dr. Grady Cooper House NRMR N-12	c. 1895	1800 College St.
Hanna House NRMR M-12	c. 1886	2112 Main St.
Harrington House	c.1818	1905 College St.
Harrington St. Historic District Ref.# 80004462	1980*	Harrington St.
Helena	c.1851	due East of Newberry
Helena Cottage 11-K	c. 1890	Giff and Vincent St.
Hentz House NRMR N-19	1920's	1609 College St.
Hipp-Martin House	c. 1895	Caldwell St. Extension, 4 miles south Ebeneezer Rd. on east side of extension
Holmes House	c.1886	1228 Walnut St.
Home Furniture Store NRMR A-16	c. 1908	Friend St.
Houseal House	c.1857	1315 Glenn St
Isaac Hunt House NRMR M-25	1908	1225 Calhoun St.
JT McCracken House NRMR N-7	c. 1915	1618 College St.
James H. Davis House		930 Cline St.
General James H. Williams NRMR M-15, SC 61	c. 1850	1905 Main St.
James K. Gilder House NRMR B-3	c. 1890	733 Boundary St.
Dr. James Kibler House	c. 1890	937 Cornelia
The Jean Shop NRMR A-9	c. 1908	Lindsay and Main
JN McCaughrin House NRMR M-49	1910	1208 Calhoun St.
John Caldweil's House NRMR C-2	c.1820	808 College St.
John F. Chappell House NRMR M-9	c. 1900	1908 Main St.
John Elmore House	c. 1880	Nance St. Ext.

	and the second se	
John M. Kinard House NRMR M-5	c. 1900	1100 Calhoun St.
John R. Leevell House NRMR W-3	c. 1870	515 Boundary St.
John H. Pearson House NRMR M-15	c. 1840	1213 Crenshaw St.
John Scurry House NRMR N-11	c. 1915	1807 College St.
John Stone-Rutherford NRMR N-4	1904	1703 College St.
Julian M. Smith House NRMR M-8	c. 1870	1822 Main St.
Kibler House NRMP P-4	c. 1895	757 Pope St.
LL Brice House NRMR M-41	c. 1900	2015 Main St.
Lambert W. Jones House NRMR B-5	c. 1870	819 Boundary St.
Lane House	c. 1860	2133 Oak St.
Leonnhirth House 11-A	c. 1885	2326 Vincent St.
Livingston Cottage	c. 1875	1700 Vincent St.
Lominack House NRMR M-36	c. 1900	1231 Summer St.
Lominack House #2 NRMR M-37	1907	1225 Summer St.
Lonnie Shealy House	c. 1910	1005 Wilson St.
Mt. Bethel Academy Site	1794-1820	off Hwy.176 between County Rds.44 & 81, 9 mi. NE of Newberry
Main St. Historic District Ref.# 80004463	1980*	
Martin House	c.1840	1531 Main St.
The Martin House	c. 1870	1603 Harrington St.
Mary Baker Summer House NRMR M-45	c. 1930	1903 Main St.
Maybin-Poole House NRMR 9	1871	1727 Harrington St.
Mazyck	c. 1870	824 O'Neal St.
McCullough-Shinn	1891	1828 Harrington St.
McDowell House	c. 1900	721 Pope St.
McWhirter House NRMR B-10	c. 1860	1209 Drayton St.
Mollohun Mill Site	1902	Glenn and Milligan Streets
Moore House NRMR N-14	c. 1895	1720 College St.
Mower House Ref.# 80003683	c.1893	1526 Boundary St.
Murphy House NRMR N-44	1910	1927 Main St.
1		



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Nance House		516 Boundary St.
Newberry ARP Church NRMR M-17	1908	1206 Calhoun St.
Newberry College (Historic District) Ref.# 76001706		
Newberry Community Hall (Old Courthouse) Ref.# 71000791	1856	2100 College St.
Newberry Cotton Mill Reservoir NRMR B-4	1898	SE corner Main and Drayton St.
Newberry County Courthouse NRMR A-1	1908	Corner of College and Harrington
Newberry Electric Light and Water Plant		1897 Nance St.
Newberry Fire House	c. 1888	McKibben St.
Newberry First Baptist Church NRMR C-1	1852	1207 Caldwell St.
Newberry Historic District Ref. # 74001870	1831 organ 1907	736 Caldwell St.
Newberry Historic District (Boundary Increase) Ref.#80003680	1973*	Includes city public square & surrounding blocks
Newberry Mill Barer Shop NRMR B-12	c. 1919	1005 Drayton St.
Newberry Mill Boarding House NRMR B-13	c. 1910	Corner Drayton and O'Neal
Newberry Old Post Office	1911	1300 Friend St.
Newberry Opera House Ref.# 69000171	1980*	
Newberry Village Cemetery		Corner Coastes & Snowden Streets.
Newberry Water/Light Building		1935 Nance St.
Nichols Studio NRMR A-5	1915	1311 Main St.
NRMR A-7	c. 1907	1317 Main St.
NRMR B-16	c. 1875	714 O'Neal St.
NRMR B-19	c. 1900	922 Drayton St.
NRMR B-21	1882	Corner of Nance & Boyce St.
NRMR B-22	c. 1910	823 Boundary St.
NRMR B-23	c. 1905	900 Boundary St.
NRMR B-25	c. 1920	824 Boundary St.
NRMR B-26	c. 1940	800 Boundary St.
NRMR B-27	c. 1900	726 Boundary St.
NRMR B-32	c. 1910	722 Boundary St.
NRMR P-6	c. 1895	773 Pope St.
Nonis House	c. 1895	2430 Main St.

O. L. Schumpert NRM N-1	c. 1910	Homan and Main Streets
Old Newberry Female Academy	c. 1900	817 Boundary St.
Old Newberry High School	c. 1915	Martin and McNorris
Oakhurst Ref.# 79002389	Before 1860	909 College St.
Old Newberry Male Academy	1970*	2723 Main St.
O'Neal's Mill Site	c.1870	1912 Harrington St.
Osborne Wells House Survey 34 74 ,NRMR 78, SC 60	1800	1101 Fair St.
Pearson-Summer-McMaughrin House	Before 1776	7 mi. S of Newberry on the Bush River and SC 295
Poole-Trefsgar	c. 1910	1517 Johnstone
Purcell House NRMR M-3	1930	1818 Main St.
Pratt House	c.1840	1213 Crenshaw St.
Proctor Cottage 11-G	c. 1960	2331 Cottage St.
Proctor House 11-H	c. 1865	2329 Cottage St.
Quaker Cemetery	Before 1837	734 Boundary St.
Richard Julian House 11-B		Giff St., Helena
Reighley-Ike House Ref.# 80003684		on County Rd. 66, 4 mi. SW of Newberry
Regnery House	c. 1950	1800 Johnstone St.
Riebe House	1980*	2304 Main St.
Robert Welch House	c. 1899	1831 Johnstone St.
Rook House NRMR-28	c. 1935	1604 Main St.
Rook House # 2 NRMR M-3	c. 1910	1608 Main St.
Rosemont Cemetery	Est. 1853	College St.
Salter House 11-F	c. 1870	2315 Cottage St.
Scholtz House NRMR N-15	c. 1895	1704 College St.
Scott Henderson House NRMR N-8	c. 1900	1616 Calhoun St.
Section House 11-C	c. 1860	2327 Vincent St., Helena
Seltzer House NRMR N-20	1930	1509 College St.
Shull House NRMR M-35	c. 1950	2102 Main St.
Site of the Battle of Bush River	C. 1895	933 Cline St.
Sligh House NRMR N-2	c. 1885	1814 College St.

Sligh House	c. 1870	2322 Cottage St.
Li-i	1020%	1615 College St
Smila House	1920 \$	1013 College SL
NRMR A-11	c. 1915	1310 Main St.
The Spears House	c. 1875	1711 Nance St.
Spearman House	1906	1801 College St.
NRMR N-13		
Spearman-Wallace NRMR N-3	c. 1910	1806 College St.
Dr. Spencer Welch House 11-J	c. 1860	918 Giff St., Helena
Spencer Welch House NRMR P-3	c. 1898	803 Pope St.
Sprouse House NRMR M-42	1910	1933 Main St.
Sterling House NRMR P-1	c. 1900	808 Pope St.
Stevens Cottage NRMR-12	1875	1706 Vincent St.
Stewart House Ref.# 80003685	May 22, 1781	on County Rd. 64, NW of Newberry where it crosses the Bush River
Stewart House	1842	1001 Wilson St.
Survey 48 74, NRMR-6, SC 35		
Summer House	c. 1905	2026 Main St.
NRMR M-11		
Summer House #3	c.1842	1001 Wilson St.
Summer House 11-D	1879	2330 Vincent St., Helena
Summer Brothers Stores Ref.# 80003686	c. 1900	903 Caldwell St.
St. Luke's Episcopal Church	1980*	900 Main St.
St. Luke's Episcopal Parish :House NRMR M-27	c. 1905	1605 Main St.
Tarrant House NRMR B-20	1855	NW corner of Main & Calhoun St.
Tarleton's Tea Table Site	c. 1870	807 Boundary St.
Tharnton Store NRMR B-12B	1930	Drayton St.
Thomas Q. Boozer House NRMR C-8	January 9, 1781	on Rt. 66 5 mi. N of Newberry
Thomas F. Harmon House NRMR B-14	c. 1870	904 Boundary St.
Timber House Ref.# 80003687	c. 1888	709 Caldwell St.
Tumer & Taylor Jewlers NRMR A-13	c. 1907	Main St.
Verner House	1910	1910 College St.

NRMR N-9		
Vincent St. Historic District Ref.# 80003688	c.1845	1426 Ebenezer Rd.
Dr. Walter Houseal House Survey 5674, NRMR 7, SC 51	1857	1315 Glenn St.
Walter Hunt House NRMR M-21	1980*	Vincent & Crosson St.
Watson House NRMR P-2	c. 1900	800 Pope St.
Wells House Ref# 800003690	1872	1334 Calhoun St.
Wells Japanese Garden Ref# 80003689	c.1850	corner of Nance & Fair St.
West Boundary St. Historic District Ref.# 80003691	1980*	Lindsay St.
Westend Grocery Stoner NRMR B-15	1900	1430 Drayton St.
William Smith House NRMR M-23	1980*	on Boundary & Jessica St.
Williams-Part House	c. 1880	1223 Calhoun St.
William Mays House NRMR 17	c. 1810	1915 Harrington
William Preston Houseal House	1880's	931 Cornelia St.
Willowbrook Employers Club NRMR B-14	1930's	Drayton St.
Willowbrook Park NRMR B-11	c. 1909	
Wilson House NRMR M-13	c. 1890	1921 Main St.
Wright-Clary NRMR N-5	c. 1910	1710 College St.
Wright-Turner House NRMR M-32	c. 1915	1912 Main St.
Zaccheus Wright Mansion NRMR C-13	c.1847	1905 Main St.
Zoble House 11-E	c. 1888	2328 Cottage St.
1912 Caldwell St.	1901	1912 Caldwell St.

## Important Archaeological Sites

Within Newberry County, there are 494 known archaeological sites. Over sixty percent of these are located in the Sumter National Forest, and as a result, they cannot be listed for purposes of protecting them. A variety of site sizes are included in the 494- they range from having only two to four artifacts to significant sites that are listed on the National Register of Historic Places.



## Unique Commercial or Residential Areas

## Newberry Historic District (a.k.a. Newberry Public Square Historic District)

This district is bounded by portions of Boyce Street, Caldwell Street, Coates Street, College Street, Friend Street, Harrington Street, McKibben Street, Main Street and Nance Street.

Identified with six structures built between 1850 and 1900, this district exhibits architectural styles such as Greek, Gothic and Romanesque revival with such accouterments as fluted columns, Doric entablatures, and a cornice of egg and dart motif.

The commercial and public buildings of this district were constructed during the period when Newberry was undergoing initial economic development and was becoming an important stop along the railroad route from Columbia to Greenville.

## Newberry College Historic District

This district is bounded by College Street, Bachman Street, and Evans Street, located on the campus of Newberry College in the town of Newberry, S.C. Identified with four buildings, this historic district typifies late nineteenth and early twentieth century institutional architecture, exhibiting Victorian style in its earlier construction, and Neo-classical revival in its later building. The four buildings which comprise this district significantly represent the college's development between the years 1877 and 1925.

Boundary Street-Newberry Cotton Mills Historic District

This district of two distinct historical neighborhoods is bounded along sections of Boundary Street, Charles Street, Academy Street, Crosson Street, Drayton Street and Tarrant Street, and is located in the town of Newberry, S.C.

This district includes one hundred forty-four contributing properties, which range from classical and vernacular styles, dating between 1857-1898, to a village of frame and clapboard dwellings constructed between 1885-1910, among other historic structures.

One section of this district represents the residences of the upper and middle professional class of Newberry during that period while the other section represent the city's first industrial complex and factory workers' residential village during that period.

## Caldwell Street Historic District

This district is bounded by portions of Caldwell Street, Boundary Street, Coats Street, and Snowden Street, is located in the town of Newberry, S.C. Significant features of this eleven property district, dating between 1885 to 1918, include styles ranging from upcountry plantation to decorated Victorian to neo-classic, providing the streetscape with a unity of mass and scale through a diversity of form. Surrounded by spacious yards and sheltered by aging trees, this district represents the affluent life style of Newberry financial leaders whose prosperity grew with the establishment of the historic Newberry Cotton Mills in 1884.

#### **College Street Historic District**

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This district is bounded by portions of College Street, and is located in Newberry, S.C. Initially developed in the 1880's, this residential neighborhood containing 20 contributing properties depicts an architectural variety of styles through 1925, with homogenous scale in a series of clapboard houses along the east streetscape. Significant west side features include large clapboard dwellings, Victorian cottages and clapboard California bungalows.

This district reflects the development of the neighborhood since its beginning as a faculty residential section for Newberry College in the 1880's. Today it retains a strong sense of residential unity.

#### Harrington Street Historic District

This district is bounded by portions of Harrington Street, located in the town of Newberry, S.C. Identified with eleven contributing buildings which span the period from ca. 1870 to ca. 1930, this district exhibits architectural styles including Victorian raised cottage, the neo-classic mansion, and various vernacular modes. The district enjoys a relative lack of modern intrusion, and retains visual integrity. This district reflects the periods during which Newberry experienced its greatest economic prosperity.

## Main Street Historic District

This district is bounded by portions of Amelia Street, Calhoun Street, Cheatham Street, Crenshaw Street, Friend Street, Glenn Street, McMorris Street, Main Street, Martin Street, and Walnut Street, located in the town of Newberry, S.C.

Identified with 50 contributing properties which span a time period from the 1850's to the 1930's, this district is made up of a diversity of architectural styles, with an unusual homogeneity of proportion and texture. Predominant elements are the large clapboard, two story dwellings of asymmetrical form typical of the Victorian period.

This district reflects the agricultural and mercantile wealth of ante-bellum Newberry.

## Vincent Street Historic District

This district is bounded by portions of Crosson Street and Vincent Street, located in the Town of Newberry, S.C. Identified with seven contributing properties, this district exhibits a compact

collection of late nineteenth to early twentieth century style structures. Among the most notable buildings are the twin raised cottages and the Greek Revival dwelling, all on Vincent Street.

This district is significant as a cohesive collection of turn-of-the-century residences exemplary of domestic vernacular building modes prevalent in Newberry.

#### West Boundary Street Historic District

This district is bounded by portions of Jessica Street and West Boundary Street, located in the town of Newberry, S.C. Identified with four contributing properties which span a time period from the late nineteenth to early twentieth century, this district exhibits the popular building styles of the period between 1840 to 1935 including Greek Revival, classical revival, and brick bungalow, with such accouterments as Doric columns, hipped roofs, pedimented front portico. This district is significant as it exemplifies a particular late nineteenth, early twentieth century popular building style.

#### Unique Natural and Scenic Areas

Lynch's Woods lie within the City of Newberry and consist of about 331 acres. It offers a primitive natural area.

## Educational, Religious, or Entertainment Areas or Institutions

#### Newberry College

Newberry College was founded in 1856 by Lutherans and currently serves as a four year, fully accredited liberal arts college. It is supported by South Carolina, Southeastern, Florida-Bahamas, and Caribbean Synods of the Lutheran Church of America.

#### Newberry Opera House

Newberry Opera House was built in 1882 and serves as a landmark for Newberry county. During its prime, the Opera House presented some of the nation's best performers, drawing enthusiasts from throughout the Midlands. A recent renovation has been completed, providing a state-of-theart venue for acts ranging from country music concerts to Broadway productions.

#### Newberry Academy

Newberry Academy, with approximately 330 students, is a privately-owned school serving preschool through the twelfth grade. Located within the Newberry city limits, the school has been serving Newberry County since 1966. The school has experienced constant growth over the past twelve years, and in 1994 a major expansion took place. This expansion included building a new science lab, band room, and lunchroom, as well as expanding the computer lab and library and adding on more classrooms. Newberry Academy is a member of the South Carolina Independent School Association.

## The Ritz Theater

The Ritz Theater is located in the City of Newberry. The Art Deco Style theater was built in 1936 for use as a movie theater. It is the current home of the Newberry Community Players who are gradually restoring the theater.

## <u>Festivals</u>

Agrifest started in 1982 and is held on the last Saturday in April. Activities include a beauty pageant, carnival rides, arts and crafts, entertainment, and agricultural displays.

## 2. Needs and Goals

The needs related to historic and cultural resources revolve around continuing to preserve and promote the historic and cultural resources of the city. The excellent work which has been done in restoration and promotion has resulted in the attraction of visitors and is making a significant contribution of the economy of the city.

<u>Goal for the City of Newberry</u>: A Cultural Resources goal for the City of Newberry is to continue to recognize the importance of the historic and cultural resources in the policies, plans and ordinances of the city to insure that the unique character of the city is preserved and enhanced.

#### 3. Implementation Strategies and Time Frames.

Implementation strategies and time frames for achieving the cultural resources element goals are included in Chapter Eight of this Comprehensive Plan.

CULTURAL RESOURCES MAP

# CHAPTER V COMMUNITY FACILITIES ELEMENT

The quality of community facilities has a great impact on the livability of a community as well as the capacity to accommodate economic development and urban growth. This element of the comprehensive plan will address a range of community facilities and services, including:

Water Solid Waste Libraries Natural Gas Sewer Public Safety Recreation General Government Services Transportation Education Electricity

## A. Newberry County

1. Inventory

## **Transportation**

**Roads**: Newberry County contains approximately 313 thoroughfare miles. Approximately one-tenth of the 313 miles of road falls in the City of Newberry urban area. Table F-1 indicates road mileage by functional classification.

## TABLE F-1

## EXISTING MILAGE BY FUNCTIONAL CLASSIFICATION Source: <u>Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, Central Midlands Regional Planning Council, June, 1996

Roadway Classification	Estimated Length in Miles	Percent of Total
Interstate	26	8%
Major Arterial	0	-
Minor Arterial	115	37%
Major Collector	172	55%
Total	313	100%

The transportation map indicates that Newberry County is dominated by a secondary road system since the City of Newberry is the only major traffic generator. The network in and around the City shows a local distribution pattern with direct access to the interstate system.

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Only one major arterial highway segment is near the City, which routes traffic parallel to the northeast side of the City through its newly growing commercial corridor. Despite a few spots of intense traffic growth there are currently no capacity deficiencies in the thoroughfare network countywide.

Table F-2 shows the traffic counts for selected roads in the county. (See attached maps for station locations.)

## TABLE F-2

# TRAFFIC COUNTS FOR SELECTED ROADS IN THE COUNTY Source: <u>Newberry County Traffic Count Data</u>, 1992-1996, Prepared by Central Midlands Council of Governments Figures represent Estimated Annual Average Daily Traffic (AADT)

Station	Route-	Route	Station Location	1992	1993	1994	1995	1996	1997
No: 101	US 76	US 76	Laurens Co. to US 76 Business	2,200	2,500	2,200	2,500	2,400	2,500
107	US 76	CR Koon Rd.	SC 34 to US 76 Business	11 <b>,40</b> 0	12,100	11,900	14,100	13,000	13,800
109	US 76	CR Koon Rd.	US 76 Business to S-82	8,400	8,800	9,300	11,600	9,800	10,600
111	US 76	US 76	S-82 to Lexington County	3,900	4,400	3,900	4,600	4,300	4,400
119	US 176	US 176	Union County to SC 72	5,000	5,200	5,700	6,400	6,200	6,100
121	US 176	US 176	SC 72 to SC 34	3,100	3,400	3,600	4,200	3,900	3,900
117	US 76 BU	Adelaide Rd.	SC 34 Bus/S-383 to US 76	1,350	1,450	1,400	1,200	1,350	1,200
123	US 176	US 176	SC 34 to Sc 219	800	800	750	750	700	750
125	US 176	US 176	SC 219 to Richland County	1,650	1,300	1,350	1,250	1,350	
129	SC 34	SC 34	Greenwood County to Local Rd.	2,200	2,300	2,500	2,600	3,000	3,500
130	SC 34	SC 34	Local Rd. to SC 39	2,100	2,500	2,200	2,500	3,100	3,500

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131	SC 34	SC 34	S-48 to S-83	2,200	2,300	2,200	2,300	2,900	3,100
132	SC 34	SC 34	SC 39 to S-48	2,100	2,200	2,000	2,200	2,800	3,100
139	SC 34	SC 34	SC 395 to S-68	4,400	4,200	3,900	4,700	4,400	5,000
141	SC 34	SC 34	S-68 to US 76	4,500	4,600	4,500	5,200	5,300	5,700
145	SC 34	SC 34	I-26 to Fairfield County	2,000	2,100	2,400	2,300	2,500	2,800
167	SC 121	SC 121	Saluda County to SC 34	2,80	2,900	3,000	3,000	3,100	3,400
181	SC 121	SC 121	US 76 Business to US 176	5,400	6,400	5,900	7,000	6,500	6,300
185	SC 202	SC 202	I-26 to US 176	800	800	800	900	850	800
191	SC 219	SC 219	S-505 to I-26	4,400	4,100	4,200	5,200	4,700	5,200
193	SC 219	SC 219	I-26 to US 176	1,450	1,350	1,250	1,350	1,250	1,400
217	S-32	Jalapa Rd.	US 76 to I-26	275	325	325	325	400	500
219	S-32	Jalapa Rd.	I-26 to SC 66	150	225	150	150	200	175
2113	I-26	Interstate 26	Laurens County SC 66 to S-3	22,700	22,300	22,800	23,000	24,400	27,900
2115	1-26	Interstate 26	S-32 to SC 121	22,800	22,100	22,900	23,100	24,300	27,800
2117	I-26	Interstate 26	SC 121 to SC 34	22,000	23,800	22,400	23,600	22,900	25,900
2119	I-26	Interstate 26	SC 34 to SC 219	21,200	22,200	21,800	23,600	22,200	24,200
2121	I-26	Interstate 26	SC 219 to SC 773	23,300	25,600	24,500	26,300	25,000	27,400
2123	1-26	Interstate 26	SC 773 to SC 202	23,700	26,800	25,800	27,500	26,600	28,700
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Table F-3 lists the necessary road improvements identified in Newberry County.

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# TABLE F-3 NEWBERRY COUNTY RURAL STATE TRANSPORTATION IMPROVEMENT PROJECTS (STIP) Source: Central Midlands Council of Governments

Ranking	Project	Section of roadway	Proposed improvements
1	SC 121 (pt. 1)	SC 395 to US 76	5 lane curb and gutter
2	SC 219	Newberry City Limits to I-26	5 lane curb and gutter
3	SC 121 (pt. 2)	US 76 Bus. To I-26	multi-lane curb and gutter
4	SC 121	SC 34 to SC 395	multi-lane improvements
6	SC 34/121	Silverstreet to the City of Newberry	multi-lane improvements
9	US 176	SC 72 to SC 121	multi-lane improvements
14	SC 121 (pt. 3)	I-26 to US 176	multi-lane improvements

The seven projects listed in Table F-3 are from a list of 18 projects identified by SC Department of Transportation. Priority ranking was based on values assigned to the following criteria:

- Current volume/capacity
- Future volume/capacity
- Accident rate
- Average daily trip per lane mile (thousand)
- Proximity to existing infrastructure to any portion of the project

In addition to the above criteria, special consideration was given to the following:

- If it completes the final portion of a facility.
- If it serves a major intermodal facility.
- If it eliminates a severe safety problem.
- If it has an environmental/social impact.
- If it a part of a emergency or evacuation route.
- If there is access to quality of life assets.

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- Any other special considerations as appropriate.
- If there is any tourism benefit/impact. (discretionary criteria)
- If it provides direct access to interstate, and at what distance. (discretionary criteria)
- If it provides access to a market area.

**Railroads:** All general carload rail freight services are offered, with exception of piggyback service, via CSX and Norfolk Southern in the City of Newberry. Rail passenger service is available through AMTRAK in the City of Columbia.

Air: Utility air service is available locally at the Newberry Municipal Airport, two miles north of the City of Newberry. The municipal airport has a 3,500 foot paved and lighted runway and a 1,700 foot unlighted sod runway. Services available include flight instruction, aircraft rental, unicom, aircraft repair, 100 octane fuel, 93 octane auto fuel, tiedowns, and hangers. In addition, regularly scheduled commercial airline service is offered at the Columbia Metropolitan Airport, the Greenville/Spartanburg International Airport and Charlotte/Douglas International Airport.

**Bus:** Newberry County Council On Aging (NCCOA), desired to determine whether there existed a need for some form of public transportation. The NCCOA also believes there may be potential for creating a coordination program which would bring together transportation providers in an effort to maximize the utilization of their collective resources. The NCCOA has prepared a **Public Transit and Coordination** Plan (Transportation Service Coordination Plan for Newberry County, by CGA Consulting Services, Inc.) for the county. Currently, the only service available is on demand (the rider calls for a pick-up appointment). The request must be made 2 days in advance. This service is available to all of the human services clients and to the general public.

For intra- and interstate travel, Greyhound bus service has two stops in Newberry County- one in the City of Newberry, and one at the Country Peddler restaurant.

Utilities

Water: There are four water systems in Newberry County: The Newberry County Water and Sewer Authority, the City of Newberry, the Town of Whitmire and the Town of Prosperity. (See attached map depicting the water system.) Residents who are not tapped on to one of these systems draw their water from wells.

Water and Sewer Authority: As a special service district, the Authority's service area is defined in its enabling legislation, specifically the unincorporated areas of the county. However, the Authority has developed service agreements with the City of Newberry for the provision of service in selected areas of the unincorporated areas where service extension is mutually agreeable. The Authority's system is comprised of

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200 miles of 6 inch or larger pipes and 240 fire hydrants. The current demand is 800,000 to 933,000 gallons a day. 85% of the water is purchased from the City of Newberry, with the remaining 15% drawn from four wells. There are approximately 2,850 residential water customers. (See Appendix A for a fee schedule.)

The authority is planning to build a water plant on Lake Murray which will have an ultimate capacity of 6 mgd. This new water plant would serve the southern portion of Newberry County.

While water is available at the interstate interchanges, the supply is not sufficient for industrial or large scale residential development. The Water and Sewer Authority will make the investment to install water tanks or larger lines only when the demand requires it.

**City of Newberry:** Raw water is pumped from the Saluda River to a water treatment plant located adjacent to the river. The plant, which commenced operation in 1974, is approximately nine miles from the city limits. The treatment plant has a capacity to produce 8.1 mgd of treated water. The transmission system from the plant to the city consists of one 16 inch line and one 20 inch line capable of carrying 10 mgd. The plant is capable of being expanded to 10 mgd. Additionally, the city owns storage facilities capable of holding 4 million gallons of treated water at all times. In 1980, the city constructed an 11 million gallon raw water reservoir to be used in case of contamination. The distribution network contains approximately 142 miles of pipe, 4,556 hydrants, and 4,782 service connections.

Town of Whitmire: Currently, the town has a 1 mgd surface water plant drawing from the Enoree River. Due to recent spills upriver however, the town has recently constructed an alternate facility drawing from Duncan Creek. The town also has a 500,000 gallon stand pipe which has helped with water pressure throughout the community. There are 1,133 water customers, 393 of which are outside of the town. In April 1998, the peak flow was 798,000 gallons and the average flow was 666,000 gallons. In May 1998 the peak flow was 867,000 gallons and the average flow was 717,000 gallons. (See the Section about the Town of Whitmire for a fee schedule.)

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The town is exploring the possibility of increasing the capacity of the water plant by an additional 500,000 gallons per day. Additionally, the town is looking into selling water in Union County.

**Town of Prosperity:** The town draws water for 564 customers, 42 of these outside of the town limits, from 4 wells located within the town. Annual average consumption is 3.1 million gallons per month with peak month usage at 4.2 million gallons.

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• Wastewater: There are currently four wastewater treatment providers: the Newberry County Water and Sewer Authority, the City of Newberry, the Town of Whitmire and the Town of Prosperity. (See attached map depicting the sewer system.) Residents of the county who are not tapped-on to one of these systems use septic tanks to treat wastewater.

> Newberry County Water and Sewer Authority: The service area is the unincorporated area of the county. However, under mutual agreement, the Authority permits line extension by the City of Newberry where appropriate. The Water and Sewer Authority has two wastewater treatment plants. A small plant is located at Georgia-Pacific which is rated at 30,000 gallons per day and is currently at capacity. It discharges into a tributary of Camping Creek.

A larger plant is located in the Town of Prosperity, which discharges into the Bush River. It is rated at 650,000 gallons a day, but currently only treats approximately 150,000 gallons per day. This plant serves the Lake Murray area, the Town of Prosperity, and the US 76 corridor half way to the City of Newberry. It also has the potential to serve Billy Dreher Island. (See Appendix A for a fee schedule.)

The Water and Sewer Authority has developed a regional plan to build a sewer treatment plant on the Broad River near the Town of Peak. The treatment plant would serve the "southern Broad River Drainage Basin.", which is a 95 square mile area bounded by SC 34 and I-26. This plan was developed not only to meet increasing demand, but also to address the concerns that restrictions will be placed on the Bush River preventing expansion of the existing treatment plant.

City of Newberry: The existing sewage disposal system consists of gravity mains with strategically located lift stations, along with 138 miles of pipe, which range in size from four inches to thirty inches in diameter, and 2,114 manholes. The entire service area of the sewer unit, consisting of 4,143 connections, is serviced by a 3.22 mgd modified activated sludge process plant built in 1980. The city's plant discharges into the Bush River.

Town of Whitmire: The wastewater treatment plant is a 600,000 gallon per day biological treatment plant. The wastewater treatment facility discharges into Duncan Creek. There are 867 sewer customers, 184 are outside of the town. See the Section about the Town of Whitmire for a fee schedule.

The town has recently completed a preliminary engineering report to upgrade the facility to about 1.1 mgd.

Town of Prosperity: The town operates and bills for its own sewer system with treatment being handled by the Newberry County Water and Sewer Authority.

Electricity: There are five electricity providers in Newberry County:

- The City of Newberry provides electricity within the city limits and vicinity.
- Duke Power, which provides electricity to the northern part of the county, and
- SCE&G which provides electricity to the southern part of the county.
- Newberry Electric CO-OP provides electricity to the unincorporated areas of the county as well as some of the towns.
- The Town of Prosperity provides electricity within the town limits.

Natural Gas: The Clinton-Newberry Natural Gas Authority provides service to Newberry County. (See attached map depicting the gas system.)

# Solid Waste

In February 1994, a Solid Waste Management Plan for Newberry County was drafted by the Newberry County Solid Waste Advisory Council. The county operates a greenbox system but one of the recommendations of the 1994 Plan was to gradually switch to manned convenience centers.

Newberry County: Residential solid waste is collected in 300 greenboxes located at some 76 sites spread throughout the unincorporated area of the county. These sites are neither manned nor monitored.

Commercial solid waste from small businesses in the unincorporated area is disposed of in the county owned and operated greenboxes. The commercial waste is collected and then sent to the county transfer station for disposal. Businesses in the county receive this service at not charge. The larger commercial enterprises contract with one of the several large private collection and disposal companies.

Industrial: In Newberry County, industries are responsible for their own solid waste collection and disposal. There are several private haulers operating in the county under separate contracts with different industries.

Institutional: Schools, libraries, government agencies and other publically owned institutions currently use greenboxes to deposit their solid waste. These greenboxes are collected by the county in the unincorporated areas, and by the City of Newberry and the Towns of Whitmire

and Prosperity within the municipal limits, and by a private hauler in the other towns in Newberry County.

**Disposal:** Residential and some commercial solid waste collected in Newberry County is brought to the county's transfer station located on Highway 34, approximately 3 miles from the City of Newberry. The transfer station was completed and became operational in December 1993. Waste Management Incorporated operates the Transfer Station for Newberry County under contract. The facility has a concrete tipping floor with a sheet metal cover building and has a design capacity of up to 400 tons per day.

The solid waste is collected and hauled to the transfer station from distance ranging from ½ a mile to 30 miles. Upon arriving at the transfer station, the garbage is dumped onto the tipping floor where it is inspected for material which is unacceptable for disposal in the landfill. The remaining acceptable garbage is then pushed, using a small front-end loader, into one of two bays. The garbage is then fed from the bays into a tractor trailer. The garbage is somewhat compacted in the bays by the natural force of gravity. Leachate and wash down water is transported to the City of Newberry's Wastewater Treatment Plant. The waste is transported to Waste Management Corporation's landfill located at the interchange of Hwy 29 and I-26 near Welford in Spartanburg County.

### Public Safety

Fire: The county has a total of 11 fire stations which are all run by volunteers. Table F-4 gives the station location and number of employees. (See attached map depicting Fire, EMS and Public Safety facilities.) The county has an ISO rating of 7.

# TABLE F-4 INVENTORY OF FIRE FACILITIES

Source: <u>Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, Central Midlands Regional Planning Council, June, 1996

Station location	Volunteers (as of May 11, 1998)
Bush River	17
Chappells	22
Pomaria	22
Prosperity	23
Consolidated	31

Fairview	25
Friendly	28
Little Mountain	26
Silverstreet	25
St. Phillips	26
Whitmire	33

Sheriff: The Sheriff's Department is located at 3239 Louis Rich Drive along with the detention center. Of the 28 sworn deputies (including the sheriff), 21 are uniformed and 7 are plainclothed. There are 2 civilian secretaries, and 11 full-time and 3 part-time dispatchers. Dispatching operates out of the same location. There are no sub-stations or satellite offices.(See attached map depicting Fire, EMS and Public Safety facilities.)

The detention center has a capacity of 43, but currently the total number of inmates is 84. There are 14 officers that work full-time. Due to the overcrowding, there has been discussion of either expanding the present facility or building a new one.

EMS: Both the City and the County EMS systems are operated by the County Memorial Hospital and the Rescue Squad. Table F-5 gives the location of each station and the number of employees at each station. (See attached map depicting Fire, EMS and Public Safety facilities.)

# TABLE F-5

# **INVENTORY OF EMS FACILITIES**

Source: <u>Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, Central Midlands Regional Planning Council, June, 1996

Rescue squad station	Volunteers
Lake Murray	14
Little Mountain	29
Newberry	26
Pomaria	20
Prosperity	21
Whitmire	18

# **Recreation:**

Newberry County does have a Recreation Commission. There are some ballfields and picnic areas that are maintained by the County Public Works Division, including ballfields in Pomaria, Prosperity, Silverstreet, and Whitmire. (See map depicting location of parks and government facilities.) A county resident who does not live in the City of Newberry may pay a \$100 fee per household per year to participate in city-sponsored activities at the parks. An additional fee for a specific activity may also apply.

### **Education:**

The Newberry School District's 1997 school year total enrollment was approximately 5,893 students. The district office is located in the City of Newberry at 1539 Martin Street. At the time this plan was written the school district was entering Phase 5 of a six-year plan it has implemented to improve the district's schools. During the upcoming phase, the new Newberry Middle School will be completed. During Phase 6, the final phase, the district plans to renovate and add on to Spears Street Elementary and Boundary Elementary, expanding their grade levels from K-3 to preK-5. This phase may be adjusted due to a projected increase in the enrollment at these schools during the academic year 1999-2000. Below are enrollment figures for the school district since 1991-1992:

1991-1992	6,092
1992-1993	6,086
1993-1994	5,987
1994-1995	5,828
1995-1996	5,771
1996-1997	5,840
1997-1998	5,893

Table F-6 lists each of the schools in the county, their location, and their enrollment for the school year 1997-1998. (See map depicting locations of schools and libraries.)

# TABLE F-6

### INVENTORY OF SCHOOLS

Sources: Newberry County School District

# <u>Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, Central Midlands Regional Planning Council, June, 1996

Enrollment and grade levels provided by the Newberry County School District

School	Enrollment 97-98 School Year	Location	Grades
Boundary Elementary	485	1406 Boundary Street, Newberry	PreK-3 and special education
Gallman Elementary	445	540 Brantley Street, Newberry	4-5 and special education
Little Mountain Elementary	232	692 Mill Street, Little Mountain	K-5
Mid Carolina Middle	474	6834 US Highway 76, Prosperity	6-8
Mid Carolina High	553	6794 US Highway 76, Prosperity	9-12
Newberry High	910	3113 Main Street, Newberry	9-12 and special education
Newberry Middle	752	1829 Nance Street, Newberry	6-8 and special education
Newberry Learning Center	58	3321 Main Street, Newberry	9-12
Newberry Career Center	687	3413 Main Street, Newberry	9-12
Pomaria/Garmany Elementary	273	7288 US Highway 176, Pomaria	K-5
Prosperity/Rikard Elementary	415	381 South Wheeler Avenue, Prosperity	PreK-5
Reuben Elementary	191	3605 Speerman Road, Newb <del>e</del> rry	PreK-6
Speers Street Elementary	513	1121 Speers Street, Newberry	PreK-3 and special education
Whitmire Elementary	308	2597 SC Highway 66, Whitmire	K-6
Whitmire High	284	1402 Coleman Avenue, Whitmire	7-12

Located within the City of Newberry is Newberry Academy, which provides K3-12 education for students throughout Newberry County. Last year's enrollment was 85 students in K3 and 225 students in grades 1-12. Extensive expansion was done in 1994 which included enlarging the library, computer lab, and lunch room. Also included in the expansion were the addition of

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two classrooms for kindergarten and two for 1-12, as well as building a new gym. Currently, there are no plans for any future expansion.

Other education is provided in the City of Newberry through Newberry College, a fully accredited four-year co-educational liberal arts college supported by the South Carolina, Southeastern, and Florida Synods of the Lutheran Church of America. Additionally, Piedmont Technical College has a satellite campus located on Wilson Road. The University of South Carolina, Columbia College, Allen University, Benedict College, Columbia Bible College, Lutheran Theological Seminary, Presbyterian College, Lander University, and Midlands Technical College are additional institutions of higher education, all located within 40 miles of the City of Newberry.

### Libraries:

Within Newberry County there are two main library facilities. The Newberry County Library is located at 1300 Friend Street within the city of Newberry. There they offer children's programs such as story time. The Whitmire Memorial Library, a branch of the Newberry County Library, is located at 1510 Church Street in Whitmire. (See map depicting locations of schools and libraries.) Currently, the library does not offer bookmobile service, and there are not definite plans for expansion. There is a deposit located in a store in the Chappells area. The books there are rotated on a quarterly basis.

Table F-7 lists the location of each library, the circulation and any future plans identified.

#### TABLE F-7

# INVENTORY OF LIBRARY FACILITIES

Source: <u>Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, Central Midlands Regional Planning Council, June, 1996

Library	Circulation	Future plans
Regional Library	71,920	None Immediate
Whitmire Memorial	24,561	None Immediate

# <u>Health</u>

The Newberry County Health Department is located in the City of Newberry at 1308 Hunt Street. The department offers environmental health, family planning and WIC (women/infant care) services.

Newberry County Memorial Hospital is located at 2669 Kinard Street in the City of Newberry. The hospital has 102 bed and is currently doing renovations to the facility. The hospital has also developed a 5 year master plan for expansion, but no work has begun. There is 1 doctors' office associated with the hospital.

### Social Services

The Department of Social Services is located in the City of Newberry at 1308 Hunt Street. The department handles abuse cases and other related functions.

### **Other Services**

The Newberry County Courthouse Annex is located at 1309 College Street. The County Administrator's office and County Council Chambers are located in the Annex. Other county offices are located in the Newberry County Courthouse which is also on College Street.

### 2. Needs and Goals:

In a county the size of Newberry, it is common for the county government to be responsible for providing services such as police, fire, EMS and sanitation not only to the unincorporated area, but also to the smaller municipalities that do not have the resources to provide these services. However, some of the services, as indicated by the above inventory, need to be expanded to meet the needs of the county. The following needs and goals have been identified for the county:

Water: The current water infrastructure at the interstate interchanges is insufficient to meet the needs of potential industrial development or large residential development.
The Newberry County Water and Sewer Authority has made a business decision to not upgrade their lines or install water tanks at the interchanges until demand warrants the expense, an expense that would have to be borne by their existing customers.
However, the opportunity costs for the county's economy could be great if potential developments overlook the county because the infrastructure is insufficient. A single entity serving the middle and lower parts of the county would be the most efficient way to provide water service.

<u>Goal</u>: The creation of a single water provider to serve both the middle and lower parts of the county.

Sewer: Again, the concern is the availability of service at the interchanges. There is the added concern that future expansion of existing plants on the Bush River will be impossible. The plan proposed by the Newberry County Water and Sewer Authority would meet both of these concerns, and could be accomplished in phases. As with water service, a single entity serving the middle and lower parts of the county would be

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the most efficient way to provide sewer service.

<u>Goal</u>: The creation of a single sewer provider to serve both the middle and lower parts of the county.

Sheriff: The City of Newberry, and the Towns of Whitmire and Prosperity are the only municipalities that provide for police protection. The rest of the county is served by the sheriff's department.

<u>Goal</u>: The county should explore the possibility of providing substations placed in strategic locations around the county to maximize service and reduce response times.

Recreation: Currently, the only jurisdictions providing organized activities are the City of Newberry and the Town of Whitmire. In the city's case, those who live outside of the city must pay an extra \$100 to be eligible to participate in activities offered by the city. (See the sections abut the City of Newberry and the Town of Whitmire for a discussion of facilities available). The county's role in recreation is limited to the maintenance of ballfields and picnic areas.

<u>Goals</u>: The County Recreation Commission should develop a program to provide activities to the residents of the county.

Library: Since there are only two branches of the library in the county, some of the residents of the county do not have the opportunity to take advantage of the resources available.

<u>Goal</u>: The county should encourage the development of a bookmobile service which could serve the unincorporated areas but also the other municipalities.

**Building Code Enforcement:** Currently, the only jurisdiction offering building code enforcement is the City of Newberry. Adopting and enforcing a building code would help to ensure that structures are built safely, and would also help in the reduction in the fire ISO rating.

<u>Goal</u>: The County, in conjunction with the other municipalities, should adopt a set of building codes that the county would then enforce.

### 3. Implementation:

Implementation strategies and time frames for achieving the community facilities element goals are included in Chapter Eight of this Comprehensive Plan.

### B. Town of Peak

## 1. Inventory

### Transportation:

Roads: The town is served only by local roads. Nearby Parr Road, a collector road, provides access to Fairfield County and to US 176, which is also a collector road. US 176 provides

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access to Richland County and to the Town of Pomaria. Table F-8 gives the traffic counts at a station near the town. (See attached maps for station locations.)

### TABLE F-8

# TRAFFIC COUNTS FOR SELECTED ROADS ENTERING THE TOWN Source: <u>Newberry County Traffic Count Data</u>, 1992-1996, Prepared by Central Midlands Council of Governments Figures represent Estimated Annual Average Daily Traffic (AADT)

Station No.	Route No.	Route Name:	Station Location	1992	1993	1994	1995	1996	1997
279	S-28	Broad River Rd.	Richland County to SC 213	1,550	1,300	1,350	1,400	1,250	1,250

**Rail:** CSX and Norfolk Southern, two non-passenger carrying railroads, provide service to the City of Newberry. Passenger service is provided by AMTRAK in the City of Columbia.

Air: Utility air service is available locally at the Newberry Municipal Airport, two miles north of the City of Newberry. The municipal airport has a 3,500 foot paved and lighted runway and a 1,700 foot unlighted sod runway. Services available include flight instruction, aircraft rental, unicom, aircraft repair, 100 octane fuel, 93 octane auto fuel, tiedowns, and hangers. In addition, regularly scheduled commercial airline service is offered at the Columbia Metropolitan Airport and the Greenville/Spartanburg International Airport.

**Bus:** Newberry County Council On Aging (NCCOA), desired to determine whether there existed a need for some form of public transportation. The NCCOA also believes there may be potential for creating a coordination program which would bring together transportation providers in an effort to maximize the utilization of their collective resources. The NCCOA has prepared a **Public Transit and Coordination Plan** (Transportation Service Coordination Plan for Newberry County, by CGA Consulting Services, Inc.) for the county. Currently, the only service available is on demand (the rider calls for a pick-up appointment). The request must be made 2 days in advance. This service is available to all of the human services clients and to the general public.

For intra- and interstate travel, Greyhound bus service has two stops in Newberry County- one in the City of Newberry, and one at the Country Peddler restaurant.

Sidewalks: The town only has sidewalks in front of the clinic and the drug store.

Utilities:

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Water: The town's residents receive their water supply from individual wells.

Wastewater: The town residents use septic tanks to treat wastewater.

Electricity: The residents purchase their electricity from SCE&G.

### Solid Waste

The residents use the county greenboxes.

# Public Safety

Fire: The town is served by the same fire station that serves the Town of Pomaria. There is a dry hydrant located in the town. A dry hydrant is used to siphon water from an adjacent lake or pond. (See attached map depicting Fire, EMS and Public Safety facilities.)

Police: Law enforcement is provided by the Newberry County Sheriff's Department. (See attached map depicting Fire, EMS and Public Safety facilities.)

EMS: The nearest EMS station is located in the Town of Pomaria. (See attached map depicting Fire, EMS and Public Safety facilities.)

### **Recreation:**

There are no recreational facilities located in the town.

### **Education:**

There are no schools located in the town. Pomaria/Garmany Elementary School (grades K-5), Mid-Carolina Middle School (grades 6-8) and Mid-Carolina High School (grades 9-12) are the schools that serve the town. (See map depicting locations of schools and libraries.)

Located within the City of Newberry is Newberry Academy, which provides K3-12 education for students throughout Newberry County. Last year's enrollment was 85 students in K3 and 225 students in grades 1-12. Extensive expansion was done in 1994 which included enlarging the library, computer lab, and lunch room. Also included in the expansion were the addition of two classrooms for kindergarten and two for 1-12, as well as building a new gym. Currently, there are no plans for any future expansion.

Other education is provided in the City of Newberry through Newberry College, a fully accredited four-year co-educational liberal arts college supported by the South Carolina,

Southeastern, and Florida Synods of the Lutheran Church of America. The University of South Carolina, Columbia College, Allen University, Benedict College, Columbia Bible College, Lutheran Theological Seminary, Presbyterian College, Lander University, Piedmont Technical College and Midlands Technical College are additional institutions of higher education, all located within 50 miles of the town.

### Library:

The Newberry County Library does not have a branch in the town, nor does it offer bookmobile service. The closest branch is located in the City of Newberry. There are no definite plans for expansion. (See map depicting locations of schools and libraries.)

# <u>Health</u>

There are no health facilities located in the town. The Newberry County Health Department is located in the City of Newberry at 1308 Hunt Street. The department offers environmental health, family planning and WIC (women/infant care) services.

Newberry County Memorial Hospital is located at 2669 Kinard Street in the City of Newberry. The hospital has 102 bed and is currently doing renovations to the facility. The hospital has also developed a 5 year master plan for expansion, but no work has begun. There is 1 doctors' office associated with the hospital.

### Social Services

There are no social services facilities located in the town. The Department of Social Services is located in the City of Newberry at 1308 Hunt Street. The department handles abuse cases and other related functions.

# **Other Services**

Town Hall is located on River Street.

### 2. Needs and Goals:

The town is completely dependant on other organizations for services in the town. However, that does not mean that the town cannot participate in the decision-making process. Having representation on the Newberry County Joint Planning Commission is one way to ensure that the town's interests are served. Fostering relationships with the county administrator, county council, the school board and other agencies, as well as passing resolutions for or against particular projects are other ways to influence decisions.

<u>Goal</u>: The community facilities goal for the Town of Peak is to continue to foster relationships with the organizations that provide services to the town.

### 3. Implementation

Implementation strategies and time frames for achieving the community facilities element goals are included in Chapter Eight of this Comprehensive Plan.

# C. Town of Pomaria

1 Inventory

#### Transportation:

**Roads:** The town is served by 2 collector roads: US 176 and SC 773. US 176 provides links to Richland County to the southeast, and intersects with SC 202, SC 773, SC 219, SC 34 and SC 121. SC 773 provides links to I-26 and to US 76.

While there are no traffic count stations located in the town, Table F-8 gives the traffic counts of one of the roads leading into town. (See attached maps for station locations.) Currently, there are no road improvements planned in town.

### TABLE F-8

# TRAFFIC COUNTS IN THE TOWN OF POMARIA

# Source: <u>Newberry County Traffic County Data, 1992-1996</u>, Prepared by Central Midlands Council of Government

Figures represent Estimated Annual Average Daily Traffic (AADT)

Stati on No.	Route No.	Route Name	Station Location Description	<b>1992</b>	1993	1994	<b>1995</b>	<b>1996</b>	1997
385	S-107	REST	US 176 to US 176	475	400	350	350	275	300

**Rail:** CSX and Norfolk Southern, two non-passenger carrying railroads, provide service to the City of Newberry. Passenger service is provided by AMTRAK in the City of Columbia.

Air: Utility air service is available locally at the Newberry Municipal Airport, two miles north of the City of Newberry. The municipal airport has a 3,500 foot paved and lighted 4runway and a 1,700 foot unlighted sod runway. Services available include flight instruction, aircraft rental, unicom, aircraft repair, 100 octane fuel, 93 octane auto fuel, tiedowns, and hangers. In addition, regularly scheduled commercial airline service is offered at the Columbia Metropolitan Airport and the Greenville/Spartanburg International Airport.

**Bus:** Newberry County Council On Aging (NCCOA), desired to determine whether there existed a need for some form of public transportation. The NCCOA also believes there may be potential for creating a coordination program which would bring together transportation providers in an effort to maximize the utilization of their collective resources. The NCCOA has prepared a **Public Transit and Coordination Plan** (Transportation Service Coordination Plan for Newberry County, by CGA Consulting Services, Inc.) for the county. Currently, the only service available is on demand (the rider calls for a pick-up appointment). The request must be made 2 days in advance. This service is available to all of the human services clients and to the general public.

For intra- and interstate travel, Greyhound bus service has two stops in Newberry County- one in the City of Newberry, and one at the Country Peddler restaurant.

Sidewalks: The town has sidewalks throughout both the residential and commercial areas.

# **Utilities:**

Water: The town receives its water supply from the Newberry County Water and Sewer Authority.

Wastewater: The town residents use septic tanks to treat wastewater.

Electricity: SCE&G provides electricity to the town.

### Solid Waste

The residents use the county greenboxes located just outside of Town. There is also a recycling facility at the site.

#### Public Safety

Fire: The Pomaria Fire Station services Pomaria and its vicinity. Northeast Newberry County is serviced by the station located at Route 1 on Highway 34 in Pomaria. (See attached map depicting Fire, EMS and Public Safety facilities.)

Police: Law enforcement is provided by Newberry County Sheriff's Department. (See attached map depicting Fire, EMS and Public Safety facilities.)

EMS: The county EMS system is operated by the County Memorial Hospital and the Rescue Squad. The Pomaria station has 23 volunteers. (See attached map depicting Fire, EMS and Public Safety facilities.)

# **Recreation:**

There is a picnic area on US 176 near Main Street. Additionally, there is a ballfield on Folk Street. (See map depicting location of parks and government facilities.)

# **Education:**

Pomaria/Garmany Elementary School grades K-5), located at 7288 US 176, had an enrollment of 273 students during school year 1997-1998. Currently there are no plans to expand the school.

Mid-Carolina Middle School (grades 6-8) and Mid-Carolina High School (grades 9-12) are within a few miles of the town. (See map depicting locations of schools and libraries.)

Located within the City of Newberry is Newberry Academy, which provides K3-12 education for students throughout Newberry County. Last year's enrollment was 85 students in K3 and 225 students in grades 1-12. Extensive expansion was done in 1994 which included enlarging the library, computer lab, and lunch room. Also included in the expansion were the addition of two classrooms for kindergarten and two for 1-12, as well as building a new gym. Currently, there are no plans for any future expansion.

Other education is provided in the City of Newberry through Newberry College, a fully accredited four-year co-educational liberal arts college supported by the South Carolina, Southeastern, and Florida Synods of the Lutheran Church of America. The University of South Carolina, Columbia College, Allen University, Benedict College, Columbia Bible College, Lutheran Theological Seminary, Presbyterian College, Lander University, Piedmont Technical College and Midlands Technical College are additional institutions of higher education, all located within 50 miles of the town.

# Library:

The Newberry County Library does not have a branch in the town, nor does it offer bookmobile service. The closest branch is located in the City of Newberry. (See map depicting locations of schools and libraries.) There are no definite plans for expansion.

# Health

There are no health facilities located in the town. The Newberry County Health Department is located in the City of Newberry at 1308 Hunt Street. The department offers environmental health, family planning and WIC (women/infant care) services.

Newberry County Memorial Hospital is located at 2669 Kinard Street in the City of Newberry. The hospital has 102 bed and is currently doing renovations to the facility. The hospital has also developed a 5 year master plan for expansion, but no work has begun. There is 1 doctors' office associated with the hospital.

# Social Services

There are no social services facilities located in the town. The Department of Social Services is located in the City of Newberry at 1308 Hunt Street. The department handles abuse cases and other related functions.

### **Other Services**

Town Hall is located on Holloway Street.

# 2. Needs and Goals:

Many of the town's services are provided by outside agencies. Some of these services should be expanded to meet the needs of the citizens of the town:

- The library should provide bookmobile service
- The town citizens should be hooked-up to a sanitary sewer system instead of using septic tanks.
- A sheriff's substation should be located in the town.
- The town should adopt building codes and participate in a consolidated enforcement program operated by Newberry County.

<u>Goal</u>: The Community Facilities goal for the Town of Pomaria is to encourage the enhancement of the above listed services for the citizens of the town.

## 3. Implementation

Implementation strategies and time frames for achieving the community facilities element goals are included in Chapter Eight of this Comprehensive Plan.

# D. Town of Prosperity

### 1. Inventory

# **Transportation**

Roads: US 76 and SC 391 are classified as minor arterials, and Clair Brown Road and

Macedonia Church Road are classified as collector. US 76 provides access to the City of Newberry, the Town of Little Mountain, the Town of Chapin, the Town of Irmo, and the City of Columbia. SC 391 provides access to Saluda County as well as the Town of Batesburg-Leesville. Clair Brown Road provides access to SC 395.

There are no traffic count stations located in the town. (See attached maps for station locations.) Currently, there are no road improvements planned in the town.

# TABLE F-9 TRAFFIC COUNTS FOR SELECTED ROADS IN THE TOWN OF PROSPERITY

# Source: <u>Newberry County Traffic Count Data, 1992-1996</u>, Prepared by Central Midlands Council of Governments Figures represent Estimated Annual Average Daily Traffic (AADT)

Station No.	Route. No.	Route Name	Station Location Description	1992	1993	1994	1995	1996	1997
197	SC 391	SC 391	S-197 to US 76	3,000	3,200	3,200	3,600	3,300	3,500
259	S-244	Counts Sausage Rd.	SC 391 to SC 395	700	650	475	375	450	500

**Rail:** CSX and Norfolk Southern, two non-passenger carrying railroads, provide service to the City of Newberry. Passenger service is provided by AMTRAK in the City of Columbia.

Air: Utility air service is available locally at the Newberry Municipal Airport, two miles north of the City of Newberry. The municipal airport has a 3,500 foot paved and lighted runway and a 1,700 foot unlighted sod runway. Services available include flight instruction, aircraft rental, unicom, aircraft repair, 100 octane fuel, 93 octane auto fuel, tiedowns, and hangers. In addition, regularly scheduled commercial airline service is offered at the Columbia Metropolitan Airport and the Greenville/Spartanburg Jetport.

**Bus:** Newberry County Council On Aging (NCCOA), desired to determine whether there existed a need for some form of public transportation. The NCCOA also believes there may be potential for creating a coordination program which would bring together transportation providers in an effort to maximize the utilization of their collective resources. The NCCOA has prepared a **Public Transit and Coordination Plan** (Transportation Service Coordination Plan for Newberry County, by CGA Consulting Services, Inc.) for the county. Currently, the only service available is on demand (the rider calls for a pick-up appointment). The request must be made 2 days in advance. This service is available to all of the human services clients and to the general public.

For intra- and interstate travel, Greyhound bus service has two stops in Newberry County- one in the City of Newberry, and one at the Country Peddler restaurant.

Sidewalks: The town has sidewalks throughout both residential and commercial areas.

## **Utilities:**

Water: The town maintains the water system however, it receives its water supply from the Newberry County Water and Sewer Authority. There is sufficient capacity for future development.

Wastewater: The Newberry County Water and Sewer Authority treats wastewater for the Town of Prosperity. There is sufficient capacity for future development.

Electricity: The town's Department of Public Works purchases electricity from Duke Power. The town then sells the electricity to the residents.

### Solid Waste:

The town provides residential curbside pickup once a week. Commercial establishments contract with private companies for solid waste pickup.

#### Public Safety:

Fire: The Fairview Fire Station is located on Macedonia Church Road, and serves the town of Prosperity. The Prosperity Fire Station is located at 118 McNeary Street and services Prosperity and the surrounding areas. (See attached map depicting Fire, EMS and Public Safety facilities.)

**Police:** The town has 2 full-time and 1 part-time officers in its police department. The station is located 116 McNeary Street. (See attached map depicting Fire, EMS and Public Safety facilities.)

EMS: The County EMS systems is operated by the County Memorial Hospital and the Rescue Squad. The town's EMS station has 22 volunteers. (See attached map depicting Fire, EMS and Public Safety facilities.)

# Recreation

A fitness park and a ballfield are located at the intersection of US 76 and Main Street. Further down US 76, adjacent to the railroad right-of-way is a picnic area. (See map depicting

location of parks and government facilities.)

# Education

Prosperity/Rikard Elementary School (grades Pre K-5), located at 381 South Wheeler Street, had an enrollment of 415 students for the 1997 school year. Mid-Carolina Middle School (grades 6-8), located at 6834 US 76, had an enrollment of 474 students for the 1997 school year. Mid-Carolina High School (grades 9-12), located at 6794 US 76, had an enrollment of 553 students for the 1997 school year. Mid-Carolina Middle School and Mid-Carolina High School are not located in the town. (See map depicting locations of schools and libraries.) Currently, there are no plans for improvements to the schools.

Located within the City of Newberry is Newberry Academy, which provides K3-12 education for students throughout Newberry County. Last year's enrollment was 85 students in K3 and 225 students in grades 1-12. Extensive expansion was done in 1994 which included enlarging the library, computer lab, and lunch room. Also included in the expansion were the addition of two classrooms for kindergarten and two for 1-12, as well as building a new gym. Currently, there are no plans for any future expansion.

Other education is provided in the City of Newberry through Newberry College, a fully accredited four-year co-educational liberal arts college supported by the South Carolina, Southeastern, and Florida Synods of the Lutheran Church of America. The University of South Carolina, Columbia College, Allen University, Benedict College, Columbia Bible College, Lutheran Theological Seminary, Presbyterian College, Lander University, Piedmont Technical College and Midlands Technical College are additional institutions of higher education, all located within 50 miles of the town.

### Library

The Newberry County Library does not have a branch in the town, nor does it offer bookmobile service. The closest branch is located in the City of Newberry. (See map depicting locations of schools and libraries.) There are no definite plans for expansion.

# <u>Health</u>

There are no health facilities located in the town. The Newberry County Health Department is located in the City of Newberry at 1308 Hunt Street. The department offers environmental health, family planning and WIC (women/infant care) services.

Newberry County Memorial Hospital is located at 2669 Kinard Street in the City of

Newberry. The hospital has 102 bed and is currently doing renovations to the facility. The hospital has also developed a 5 year master plan for expansion, but no work has begun. There is 1 doctors' office associated with the hospital.

# Social Services

There are no social services facilities located in the town. The Department of Social Services is located in the City of Newberry at 1308 Hunt Street. The department handles abuse cases and other related functions.

# **Other Services**

Town Hall is located at 116 McNeary Street.

# 2. Needs and Goals:

Many of the town's services are provided by outside agencies. Some of these services should be expanded to meet the needs of the citizens of the town:

- The library should provide bookmobile service, to meet the needs of citizens who cannot travel to the library.
- The town should adopt building codes and participate in a consolidated enforcement program operated by Newberry County.

In addition, the town should look at enhancing the following services:

- Develop a recycling program;
- Hire an additional police officer;
- Encourage the development of a regional water and sewer provider, and
- Continue the upkeep of sidewalks and parks in the town.

Goal: The Community Facilities goals for the Town of Prosperity are:

- To encourage the expansions of services by outside agencies identified above, and
- Enhance the town services outlined above.

# 3. Implementation

Implementation strategies and time frames for achieving the community facilities element goals are included in Chapter Eight of this Comprehensive Plan.

E. Town of Silverstreet

### Revised 11/12/98

# 1. Inventory

### **Transportation**

**Roads:** The town is served by two minor arterials: SC 34 and SC 121. SC 34 provides access to the Town of Winnsboro, I-26, the City of Newberry, and the Town of Greenwood. SC 121 provides access to the Town of Whitmire and the Town of Saluda.

While there are no traffic counts available in the town, Table F-10 gives the counts for roads leading into town. (See attached maps for station locations.) Currently there are no road improvements planned in the town.

# TABLE F-10

# TRAFFIC COUNTS FOR SELECTED ROADS LEADING TO THE TOWN OF SILVERSTREET Source: <u>Newberry County Traffic Count Data, 1992-1996</u>, Prepared by Central Midlands Council of Governments Figures represent Estimated Annual Average Daily Traffic (AADT)

Station • No.	Route &	Route Name	Station Location Description	1992	-1993	<b>1994</b>	1995.	1996	1997.
131	SC 34	SC 34	S-48 to S-83	2,200	2,300	2,200	2,300	2,900	3,100
167	SC 121	SC 121	Saluda County to SC 34	2,800	2,900	3,000	3,000	3,100	3,400
255	S-49	Spearman Rd.	S-58 to SC 34	1,000	1,050	900	1,150	950	1,050
257	S-83	Deadfall Rd.	SC 395 to SC 121	325	275	275	225	325	300
261	S-363	Werts Rd.	SC 34 to S-83	500	400	550	375	25	25

**Rail:** CSX and Norfolk Southern, two non-passenger carrying railroads, provide service to the City of Newberry. Passenger service is provided by AMTRAK in the City of Columbia.

Air: Utility air service is available locally at the Newberry Municipal Airport, two miles north of the City of Newberry. The municipal airport has a 3,500 foot paved and lighted runway and a 1,700 foot unlighted sod runway. Services available include flight instruction, aircraft rental, unicom, aircraft repair, 100 octane fuel, 93 octane auto fuel, tiedowns, and hangers. In addition, regularly scheduled commercial airline service is offered at the Columbia Metropolitan Airport and the Greenville/Spartanburg International Airport.

**Bus:** Newberry County Council On Aging (NCCOA), desired to determine whether there existed a need for some form of public transportation. The NCCOA also believes there may be potential for creating a coordination program which would bring together transportation providers in an effort to maximize the utilization of their collective resources. The NCCOA has prepared a Public Transit and Coordination Plan (Transportation Service Coordination Plan for Newberry County, by CGA Consulting Services, Inc.) for the county. Currently, the only service available is on demand (the rider calls for a pick-up appointment). The request must be made 2 days in advance. This service is available to all of the human services clients and to the general public.

For intra- and interstate travel, Greyhound bus service has two stops in Newberry County- one in the City of Newberry, and one at the Country Peddler restaurant.

Sidewalks: There are no sidewalks in the town.

### **Utilities:**

Water: The water system is maintained by the Newberry County Water and Sewer Authority.

Wastewater: The town's residents use septic tanks.

Electricity: The Newberry Electric CO-OP provides electricity to the residents of the town.

# Solid Waste:

The residents use the county's manned collection center located approximately 1 mile outside of town.

### Public Safety:

Fire: The Silverstreet Fire Station is located on Highway 34 and services Silverstreet and its vicinity. (See attached map depicting Fire, EMS and Public Safety facilities.)

**Police:** A retired deputy sheriff assists the town by reporting incidents to the Newberry County Sheriff's Department. (See attached map depicting Fire, EMS and Public Safety facilities.)

EMS: The County EMS systems is operated by the County Memorial Hospital and the Rescue Squad. (See attached map depicting Fire, EMS and Public Safety facilities.)

Recreation

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There is a ballfield located on SC 34 adjacent to the railroad tracks. (See map depicting location of parks and government facilities.)

# Education

Reuben Elementary (grades Pre K-6), located at 3605 Speerman Road, had an enrollment of 191 students in school year 1997. Newberry Middle School (grades 6-8) and Newberry High School (grades 9-12) are located nearby in the City of Newberry. (See map depicting locations of schools and libraries.)

Located within the City of Newberry is Newberry Academy, which provides K3-12 education for students throughout Newberry County. Last year's enrollment was 85 students in K3 and 225 students in grades 1-12. Extensive expansion was done in 1994 which included enlarging the library, computer lab, and hunch room. Also included in the expansion were the addition of two classrooms for kindergarten and two for 1-12, as well as building a new gym. Currently, there are no plans for any future expansion.

Other education is provided in the City of Newberry through Newberry College, a fully accredited four-year co-educational liberal arts college supported by the South Carolina, Southeastern, and Florida Synods of the Lutheran Church of America. The University of South Carolina, Columbia College, Allen University, Benedict College, Columbia Bible College, Lutheran Theological Seminary, Presbyterian College, Lander University, Piedmont Technical College and Midlands Technical College are additional institutions of higher education, all located within 50 miles of the town.

# Library

The Newberry County Library does not have a branch in the town, nor does it offer bookmobile service. The closest branch is located in the City of Newberry. (See map depicting locations of schools and libraries.) There are no definite plans for expansion.

### Health

There are no health facilities located in the town. The Newberry County Health Department is located in the City of Newberry at 1308 Hunt Street. The department offers environmental health, family planning and WIC (women/infant care) services.

Newberry County Memorial Hospital is located at 2669 Kinard Street in the City of Newberry. The hospital has 102 bed and is currently doing renovations to the facility. The hospital has also developed a 5 year master plan for expansion, but no work has begun. There is 1 doctors' office associated with the hospital.



# Social Services

There are no social services facilities located in the town. The Department of Social Services is located in the City of Newberry at 1308 Hunt Street. The department handles abuse cases and other related functions.

# Other Services

Town Hall is located on Main Street.

# 2. Needs and Goals:

The town is completely dependant on other organizations for services in the town. However, that does not mean that the town cannot participate in the decision-making process. Having representation on the Newberry County Joint Planning Commission is one way to ensure that the town's interests are served. Fostering relationships with the county administrator, county council, the school board and other agencies, as well as passing resolutions for or against particular projects are other ways to influence decisions.

Some of the needed services include:

- The library should provide bookmobile service;
- A sheriff's substations should be located in the town to help reduce response time in the area; and
- The town should adopt building codes and participate in a consolidated enforcement program operated by Newberry County.

<u>Goal</u>: The community facilities goal for the town is to continue foster relationships with the organizations that provide services to the town.

# 3. Implementation

Implementation strategies and time frames for achieving the community facilities element goals are included in Chapter Eight of this Comprehensive Plan.

# F. Town of Whitmire

1. Inventory

Transportation:

Revised 11/12/98

**Roads:** SC 72 is classified as a major arterial, SC 121 is classified as a minor arterial and SC 66 is classified as a collector. SC 72 provides access to the Town of Chester. SC 121 provides access to the City of Newberry, I-26, the Town of Silverstreet, and the Town of Saluda. SC 66 provides access to I-26 in Laurens County.

Table F-11 lists the traffic counts for the stations in the town. (See attached maps for station locations.) Currently, there are no road improvements planned in the town.

# TABLE F-11

# TRAFFIC COUNTS IN THE TOWN OF WHITMIRE Source: <u>Newberry County Traffic County Data</u>, 1992-1996, Prepared by Central Midlands Council of Governments Figures represent Estimated Annual Average Daily Traffic (AADT)

Station No.	Route No	Route Name	Station Location Description	1992 5	. 1993	1994 <sup>1</sup>	1995	1996	1997.
127	US 176 C	Church St.	US 176 to US 176	1,850	2,100	2,400	2,600	2,100	2,100
165	SC 72	Church St.	S-75 to US 176	4,300	4,300	5,200	5,200	4,500	4,400
365	S-217	Duckett Ave.	S-75 to SC 72	325	550	375	300	375	425
367	S-75	Duckett Ave.	S-51 to SC 72	800	850	850	1,100	900	850
369	S-51	Byrd St.	SC 66 to SC 72	1,200	1,300	1,350	1,400	1,300	1,400
371	S-188	Gray St.	SC 66 to S-578	1,000	800	750	850	700	800

**Rail:** CSX and Norfolk Southern, two non-passenger carrying railroads, provide service to the City of Newberry. Passenger service is provided by AMTRAK in the City of Columbia.

Air: Utility air service is available locally at the Newberry Municipal Airport, two miles north of the City of Newberry. The municipal airport has a 3,500 foot paved and lighted runway and a 1,700 foot unlighted sod runway. Services available include flight instruction, aircraft rental, unicom, aircraft repair, 100 octane fuel, 93 octane auto fuel, tiedowns, and hangers. In addition, regularly scheduled commercial airline service is offered at the Columbia Metropolitan Airport and the Greenville/Spartanburg Jetport.

Sidewalks: The town has sidewalks along the major thoroughfares in both the residential and commercial areas.

Bus: Newberry County Council On Aging (NCCOA), desired to determine whether there existed a need for some form of public transportation. The NCCOA also believes there may

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be potential for creating a coordination program which would bring together transportation providers in an effort to maximize the utilization of their collective resources. The NCCOA has prepared a **Public Transit and Coordination Plan** (Transportation Service Coordination Plan for Newberry County, by CGA Consulting Services, Inc.) for the county. Currently, the only service available is on demand (the rider calls for a pick-up appointment). The request must be made 2 days in advance. This service is available to all of the human services clients and to the general public.

For intra- and interstate travel, Greyhound bus service has two stops in Newberry County- one in the City of Newberry, and one at the Country Peddler restaurant.

### **Utilities:**

Water: Currently, the town has a 1 mgd surface water plant drawing from the Enoree River. Due to recent spills upriver however, the town has recently constructed an alternate facility drawing from Duncan Creek. The town also has a 500,000 gallon stand pipe which has helped with water pressure throughout the community. There are 1,133 water customers, 393 of which are outside of the town. In April 1998, the peak flow was 798,000 gallons and the average flow was 666,000 gallons. In May 1998 the peak flow was 867,000 gallons and the average flow was 717,000 gallons.

The town is exploring the possibility of increasing the capacity of the water plant by an additional 500,000 gallons per day. Additionally, the town is looking into selling water in Union County.

Wastewater: The wastewater treatment plant is a 600,000 gallon per day biological treatment plant. The wastewater treatment facility discharges into Duncan Creek. There are 867 sewer customers, 184 are outside of the town.

The town has recently completed a preliminary engineering report to upgrade the facility to about 1.1 mgd.

# TOWN OF WHITMIRE COMMISSION OF PUBLIC WORKS WATER/SEWER RATES - SEPTEMBER 1997 Source: Town of Whitmire

#### INSIDE TOWN

Water:

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Residential (up to 4,000 gallons)	\$17.00
Each additional 1,000 gallons \$1.40	
Commercial/Industrial (up to 4,000 gallons)	\$17.00
Each additional 1,000 gallons \$1.40	

# Sewer

Residential (up to 4,000 gallons)	\$10.00
Each additional 1,000 gallons \$1.40	
Commercial/Industrial (up to 4,000 gallons)	\$10.00
Each additional 1,000 gallons \$1.40	

# **OUTSIDE TOWN**

Water:						
	Residential (up to 4,000 gallons)		\$25.50			
	Each additional 1,000 gallons	\$2.10				
	Commercial/Industrial (up to 4,000 gallons)					
	Each additional 1,000 gallons	\$2.20				
·	· · · · · · · ·					

### Sewer

Residential (up to 4,000 gallons)	\$12.50
Each additional 1,000 gallons \$1.60	
Commercial/Industrial (up to 4,000 gallons)	\$11.50
Each additional 1,000 gallons \$2.60	
Electricity: Duke Power provides electricity to the toy	vn.

### Solid Waste:

The town provides residential curbside pickup twice a week. Commercial establishments contract with private companies for solid waste pickup.

The town has a Street Maintenance Department which cuts grass and maintains curbs. The Street department also has equipment to pickup large items such as furniture and appliances.

# **Public Safety**

Fire: The town is served by Whitmire Fire Station, located at 368 Duckett Avenue, in coordination with Newberry County. (See attached map depicting Fire, EMS and Public Safety facilities.) The town recently bought and renovated the building currently used by the Fire Department. Additionally, the town has purchased a new pumper truck and a tanker truck. The current ISO rating for the town is 7.

**Police:** The town has a police department comprised of 5 full-time officers. The station is located at 210 Main Street. (See attached map depicting Fire, EMS and Public Safety facilities.) One program offered by the police department is crime-watch for the elderly.

EMS: The County EMS system is operated by the County Memorial Hospital and the Rescue Squad. As with the fire department, the town provides the facility. Currently, there are 23 members of the rescue squad. (See attached map depicting Fire, EMS and Public Safety facilities.)

# Recreation

The Town of Whitmire owns a golf course which is maintained by the Whitmire Golf Association. A person must be a member of the golf association to play the course, however, students are allowed to play for free.

The town and the Newberry County Board of Education jointly own the little-league ball park. The Whitmire High School softball team uses the ball park as well. (See map depicting location of parks and government facilities.)

The town also operates a community center, located on Park Street, which provides an organized recreation program, including classes in aerobics, dance and crafts. Residents and non-residents participated at the same rate, however, that policy is under consideration.

The town also works with a volunteer organization called the Whitmire Recreation Association to provide recreation for children ages 6-12.

Newberry County helped the town obtain \$30,000 for a walking trail. The town plans to add at least an additional \$30,000 towards the construction of the trail. It will be located on the grounds of the Newberry County Memorial Library on Church Street.

### Education

Whitmire Elementary School (grades K-6), located at 2597 SC 66, had an enrollment of 308 students in school year 1997. Whitmire High School (grades 7-12), located at 1402 Coleman Ave., had an enrollment of 284 students in school year 1997. (See map depicting locations of schools and libraries.) Currently, there are no plans for improvements to the schools.

Located within the City of Newberry is Newberry Academy, which provides K3-12 education for students throughout Newberry County. Last year's enrollment was 85 students in K3 and 225 students in grades 1-12. Extensive expansion was done in 1994 which included enlarging the library, computer lab, and lunch room, the addition of two classrooms for kindergarten and

two for 1-12, as well as building a new gym. Currently, there are no plans for any future expansion.

Other education is provided in the City of Newberry through Newberry College, a fully accredited four-year co-educational liberal arts college supported by the South Carolina, Southeastern, and Florida Synods of the Lutheran Church of America. The University of South Carolina, Columbia College, Allen University, Benedict College, Columbia Bible College, Lutheran Theological Seminary, Presbyterian College, Lander University, Piedmont Technical College and Midlands Technical College are additional institutions of higher education, all located within 50 miles of the town.

### Library

The Whitmire Memorial Library, a branch of the Newberry County Library, had a circulation of 24,561 items in 1995. (See map depicting locations of schools and libraries.) There are no definite plans for expansion.

# **Health**

There are no health facilities located in the town. The Newberry County Health Department is located in the City of Newberry at 1308 Hunt Street. The department offers environmental health, family planning and WIC (women/infant care) services.

Newberry County Memorial Hospital is located at 2669 Kinard Street in the City of Newberry. The hospital has 102 bed and is currently doing renovations to the facility. The hospital has also developed a 5 year master plan for expansion, but no work has begun. There is 1 doctors' office associated with the hospital.

#### Social Services

There are no social services facilities located in the town. The Department of Social Services is located in the City of Newberry at 1308 Hunt Street. The department handles abuse cases and other related functions.

### **Other Services**

- Town Hall is located at 210 Main Street.
- The town operates a 24-hour dispatch service in conjunction with the county's 911 system.
- The town has 22 employees providing municipal services.

The town has an Animal Control Department.

### 2. Needs and Goals:

Amenities such as the library, recreational activities and even garbage collection make the town an attractive place to live in the region. For the town to continue to be attractive to the residents, all of the amenities should be evaluated to ensure that they are meeting the needs of the residents. Those activities that can be provided on a County-wide basis should also be explored by the town.

<u>Goal</u>: The community facilities goal for the Town of Whitmire is to continue to provide and enhance the services that make it an attractive place to live and work. Additionally, the town should adopt building codes and participate in a consolidated enforcement program operated by Newberry County.

3. Implementation

Implementation strategies and time frames for achieving the community facilities element goals are included in Chapter Eight of this Comprehensive Plan.

- G. Town of Little Mountain
- 1. Inventory

### Transportation

**Roads:** SC 202 and US 76 are collector roads that serve the town. SC 202 provides access to I-26 and US 176. US 76 provides access to the City of Newberry, the town of Prosperity, the Town of Chapin, the Town of Irmo, and the City of Columbia. Table F-12 gives the traffic counts for the stations located in the town. (See attached maps for station locations.) Currently, there are no road improvements planned in the town.

### **TABLE F-12**

# TRAFFIC COUNTS IN THE TOWN OF LITTLE MOUNTAIN Source: <u>Newberry County Traffic County Data</u>, 1992-1996, Prepared by Central Midlands Council of Governments

Station No.	Route No.	Route Name	Station Location Description	1992	1993	1994	1995	1996	1997
183	SC 202	SC 202	US 76 to I-26	1,450	1,350	1,250	1,500	1,600	1,500
292	S-39	Holy Trinity Church Rd.	S-167 to US 76	750	700	750	700	750	850

# Figures represent Estimated Annual Average Daily Traffic (AADT)

**Rail:** CSX and Norfolk Southern, two non-passenger carrying railroads, provide service to the City of Newberry. Passenger service is provided by AMTRAK in the City of Columbia.

Air: Utility air service is available locally at the Newberry Municipal Airport, two miles north of the City of Newberry. The municipal airport has a 3,500 foot paved and lighted runway and a 1,700 foot unlighted sod runway. Services available include flight instruction, aircraft rental, unicom, aircraft repair, 100 octane fuel, 93 octane auto fuel, tiedowns, and hangers. In addition, regularly scheduled commercial airline service is offered at the Columbia Metropolitan Airport and the Greenville/Spartanburg International Airport.

Sidewalks: The town has sidewalks along major thoroughfares in both residential and commercial areas.

**Bus:** Newberry County Council On Aging (NCCOA), desired to determine whether there existed a need for some form of public transportation. The NCCOA also believes there may be potential for creating a coordination program which would bring together transportation providers in an effort to maximize the utilization of their collective resources. The NCCOA has prepared a **Public Transit and Coordination Plan** (Transportation Service Coordination Plan for Newberry County, by CGA Consulting Services, Inc.) for the county. Currently, the only service available is on demand (the rider calls for a pick-up appointment). The request must be made 2 days in advance. This service is available to all of the human services clients and to the general public.

For intra- and interstate travel, Greyhound bus service has two stops in Newberry County- one in the City of Newberry, and one at the Country Peddler restaurant.

### **Utilities**

Water: The town residents receive their water from the Newberry County Water and Sewer Authority and from individual wells.

Wastewater: The town residents use septic tanks to treat their wastewater.

Electricity: SCE&G provides electricity to the town.

# Solid Waste

The town residents use the county greenboxes to dispose of their solid waste.

# Public Safety

Fire: Located on Highway 26, the Little Mountain Fire Station services Little Mountain and the area outside the town limits. (See attached map depicting Fire, EMS and Public Safety facilities.)

Police: Law enforcement is provided by Newberry County Sheriff's Department. (See attached map depicting Fire, EMS and Public Safety facilities.)

EMS: Located on Highway 26, the Little Mountain Rescue Squad has 18 volunteers. (See attached map depicting Fire, EMS and Public Safety facilities.)

### **Recreation:**

Little Mountain's Reunion Park is located on Mill Street. (See map depicting location of parks and government facilities.)

# Education

Little Mountain Elementary (grades K-5), located at 692 Mill Street, had an enrollment of 232 students in school year 1997. Mid-Carolina Middle School (grades 6-8) and Mid-Carolina High School (grades 9-12) are located nearby. (See map depicting locations of schools and libraries.)

Located within the City of Newberry is Newberry Academy, which provides K3-12 education for students throughout Newberry County. Last year's enrollment was 85 students in K3 and 225 students in grades 1-12. Extensive expansion was done in 1994 which included enlarging the library, computer lab, and lunch room, the addition of two classrooms for kindergarten and two for 1-12, as well as building a new gym. Currently, there are no plans for any future expansion.

Other education is provided in the City of Newberry through Newberry College, a fully accredited four-year co-educational liberal arts college supported by the South Carolina,

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Southeastern, and Florida Synods of the Lutheran Church of America. The University of South Carolina, Columbia College, Allen University, Benedict College, Columbia Bible College, Lutheran Theological Seminary, Presbyterian College, Lander University, Piedmont Technical College and Midlands Technical College are additional institutions of higher education, all located within 50 miles of the town.

# **Library**

The Newberry County Library does not have a branch in the town, nor does it offer bookmobile service. The closest branch is located in the City of Newberry. (See map depicting locations of schools and libraries.) There are no definite plans for expansion.

### <u>Health</u>

There are no health facilities located in the town. The Newberry County Health Department is located in the City of Newberry at 1308 Hunt Street. The department offers environmental health, family planning and WIC (women/infant care) services.

Newberry County Memorial Hospital is located at 2669 Kinard Street in the City of Newberry. The hospital has 102 bed and is currently doing renovations to the facility. The hospital has also developed a 5 year master plan for expansion, but no work has begun. There is 1 doctors' office associated with the hospital.

### Social Services

There are no social services facilities located in the town. The Department of Social Services is located in the City of Newberry at 1308 Hunt Street. The department handles abuse cases and other related functions.

### **Other Services**

Town Hall is located at 206 Depot Street.

### 2. Needs and Goals:

The town is completely dependant on other organizations for services in the town. However, that does not mean that the town cannot participate in the decision-making process. Having representation on the Newberry County Joint Planning Commission is one way to ensure that the town's interests are served. Fostering relationships with the county administrator, county council, the school board and other agencies, as well as passing resolutions for or against particular projects are other ways to influence decisions.

Some of the needed services include:

- The library should provide bookmobile service;
- The town should encourage the installation of a sanitary sewer system to serve its residents;
- A sheriff's substations should be located in the town to help reduce response time in the area; and
- The town should adopt building codes and participate in a consolidate enforcement program operated by Newberry County.

<u>Goal</u>: The community facilities goal for the Town of Little Mountain is to continue to foster relationships with the organizations that provide services to the town.

### 3. Implementation

Implementation strategies and time frames for achieving the community facilities element goals are included in Chapter Eight of this Comprehensive Plan.

# H. City of Newberry

### 1. Inventory

### Transportation

**Roads:** The City of Newberry is served by a network of major arterials, minor arterials, and collectors. SC 121, SC 34 and SC 219 link the city with I-26 and US 176. The city is also directly linked to every other municipality in the county except the town of Peak. SC 121 provides access to the Town of Silverstreet and the Town of Whitmire. SC 219 provides access to the Town of Pomaria, and US 76 provides to access to the Town of Prosperity, and the Town of Little Mountain. US 76 also provides access to the Town of Chapin, the Town of Irmo, and the City of Columbia.

Table F-13 gives the traffic counts for selected roads in the city. (See attached maps for station locations.)

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# TABLE F-13

# TRAFFIC COUNTS FOR SELECTED ROADS IN THE CITY OF NEWBERRY Source: <u>Newberry County Traffic Count Data, 1992-1996</u>, Prepared by Central Midlands Council of Governments Figures represent Estimated Annual Average Daily Traffic (AADT)

Station No.	Route No.	Route Name	Station Location	1992	1993	1994	1995	1996	1997
			Description						
105	US 76	US 76	S-386 to SC 34	14,800	15,000	-15,100	17,000	16,500	15,700
107	US 76	US 76	SC 34 to US 76 BUS.	11,400	12,100	11,900	14,100	13,000	13,800
109	US 76	CR Koon Rd.	US 76 BUS. To S-82	8,400	8,800	9,300	11,600	9,800	10,600
113	US 76 BU	US 76 BU	US 76 to SC 34 BUS/S-60 BUS.	4,000	4,100	4,600	4,200	4,500	4,000
115	US 76 BU	US 76 BU	SC 34 BUS/S-60 to SC 34/S-383	6,800	7,200	7,200	6,500	6,500	6,700
135	SC 34	SC 34	SC 121 to SC 34 BUS.	2,800	2,800	2,500	3,100	3,100	3,100
143	SC 34	SC 34	US 76 to I- 26	4,900	6,600	6,300	5,300	7,800	8,000
149	SC 34 BU	SC 34/Boundary	SC 34 to SC 395	2,600	2,800	2,800	2,500	3,000	
152	SC 34 BU	Main	76 BUS. To SC 34	8,000 .	8,800	9,200	8,400	8,700	
169	SC 121	SC 121	SC 34 to SC 34 Conn.	3,300	3,000	2,600	3,200	3,000	
171	SC 121	SC 121	SC 34 Conn. To S-58	4,400	4,300	3,700	4,400	4,200	
173	SC 121	SC 121	SC-58 to S- 91	4,400	4,000	3,500	4,000	3,800	
175	SC 121	SC 121	S-91 to S-56	5,400	5,000	4,400	5,200	5,100	
177	SC 121	SC 121	S-56 to SC 395/S-103	6,900	6,600	5,400	6,900	6,800	
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179	SC 121	SC 121	SC 395/S- 103 to US 76 BU	7,600	7,200	7,100	7,900	7,600	
189	SC 219	Main	SC 34 BUS. To S-505	4,800	5,500	5,300	5,000	6,000	
203	SC 395	McKibben Rd.	S-273 to S- 161	1,800	1,800	1,850	2,100	2,100	
207	SC 395	Nance Rd.	S-127 to SC 34 BUS/S- 90	2,700	2,900	2,700	2,600	3,000	
209	SC 395	SC 395	SC 34 BUS/S-90 to SC 121/S- 103	4,500	4,800	4,800	4,400	4,700	
329	S-344	Airport Rd.	S-56 to US 76	850	800	850	1,000	1,150	
331	S-103	Nance Rd.	SC 121 to S344	650	700	750	800	800	

Table F-3 list road improvement identified in the State Transportation Improvement Plan. All but one of the listed improvements will directly affect the city.

The city recently had developed a master plan for redevelopment in the downtown area. Some components of the master plan include:

- Streetscape improvements along Main Street;
- Creation of Gateways leading to various neighborhoods in the downtown area;
- Intersection improvements:
- Parking improvements, and
- The realignment of streets west of Nance street

**Rail:** All general carload rail freight services are offered, with exception of piggyback service, via CSX and Norfolk Southern. Rail passenger service is available through AMTRAK in the City of Columbia.

Air: Utility air service is available locally at the Newberry Municipal Airport, two miles north of the City of Newberry. The municipal airport has a 3,500 foot paved and lighted runway and a 1,700 foot unlighted sod runway. Services available include flight instruction, aircraft rental, unicom, aircraft repair, 100 octane fuel, 93 octane auto fuel, tiedowns, and hangers. In

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addition, regularly scheduled commercial airline service is offered at the Columbia Metropolitan Airport and the Greenville/Spartanburg International Airport.

Sidewalks: The city has an extensive network of sidewalks in both the residential and commercial areas.

Bus: Newberry County Council On Aging (NCCOA), desired to determine whether there existed a need for some form of public transportation. The NCCOA also believes there may be potential for creating a coordination program which would bring together transportation providers in an effort to maximize the utilization of their collective resources. The NCCOA has prepared a Public Transit and Coordination Plan (Transportation Service Coordination Plan for Newberry County, by CGA Consulting Services, Inc.) for the county. Currently, the only service available is on demand (the rider calls for a pick-up appointment). The request must be made 2 days in advance. This service is available to all of the human services clients and to the general public.

For intra- and interstate travel, Greyhound bus service has two stops in Newberry County- one in the City of Newberry, and one at the Country Peddler restaurant.

#### Public Utilities:<sup>1</sup>

Water: Raw water is pumped from the Saluda River to a water treatment plant located adjacent to the river. The plant, which commenced operation in 1974, is approximately nine miles from the city limits. The treatment plant has a capacity to produce 8.1 mgd of treated water. The transmission system from the plant to the city consists of one 16 inch line and one 20 inch line capable of carrying 10 mgd. The plant is capable of being expanded to 10 mgd. Additionally, the city owns storage facilities capable of holding 4 million gallons of treated water at all times. In 1980, the city constructed an 11 million gallon raw water reservoir to be used in case of contamination. The distribution network contains approximately 142 miles of pipe, 4,556 hydrants and 4,782 service connections.

Wastewater: The existing sewage disposal system consists of gravity mains with strategically located lift stations, along with 138 miles of pipe, which range in size from four inches to thirty inches in diameter, and 2114 manholes. The entire service area of the sewer unit, consisting of 4,143 connections, is serviced by a 3.22 mgd modified activated sludge process plant built in 1980.

Electricity: The city presently obtains its supply of electrical power from the Piedmont

<sup>1</sup>General Data-Narrative, provided by the City of Newberry

Municipal Power Agency (PMPA), of which it is a member. PMPA, a public corporate body consisting of ten municipalities in South Carolina, directly or indirectly purchases electric power for resale from Duke Power Company. PMPA owns a 25% undivided interest in unit 2 of Duke Power Company's Catawba Nuclear Station, located in York County, South Carolina. PMPA has replaced Duke Power Company as the bulk supplier for all the city's power requirements, and the city is now obligated to purchase all of its bulk power supply required from PMPA. PMPA is obligated to purchase from Duke Power the additional power required to meet the bulk power supply requirements of all participants. Duke serves as a wheeling agent for PMPA by leasing its substations to each member city. Duke has a main station within the limits of the City of Newberry supplied by four 100,000 volt lines. Delivery is taken at Duke's Nance Street substation at both 24,940 volts and 4,160 volts, at the Oakland substation at 24,940, and also at the Player Street main station at 24,940 volts. The central portion of the city is supplied by a 1,200 ampere switch and Regulator Station at 4,160 volts. The outer reaches are served from the 24.9 KV circuits.

<u>Solid Waste:</u> The city provides residential curbside pickup twice a week. Commercial establishments contract with private companies for solid waste pickup.

The Streets Division maintains all of the city's rights-of-way by cutting gras, repairing sidewalks and streets, constructing and repairing the storm drainage system, and operating a mosquito abatement program.

#### Public Safety

Fire: The City of Newberry's fire department is serviced by twenty paid and twenty-five volunteer persons whose training levels vary in emergency response. Response training encompasses fire suppression, hazardous material incident management, arson investigation, and high-level, high-angle rescue. Personnel are backed by a rolling stock of 11 units equipped to support all response roles. The station is located at 1041 Wilson Road. The Friendly Fire Station, located at 927 Harrington Street, services the area outside the city of Newberry. (See attached map depicting Fire, EMS and Public Safety facilities.) The city has an ISO rating of 3.

Police: The city is serviced by a police department made up of twenty-seven sworn and four civilian employees. Services provided by the police department include community based, victim, and crime prevention programs. In addition, the department maintains its own forensics laboratory, utilizes various types of patrol, and encourages community interaction. (See attached map depicting Fire, EMS and Public Safety facilities.)

**EMS:** Both the city and the county EMS systems are operated by the County Memorial Hospital and the Rescue Squad. The EMS station in the city has 27 volunteers. (See attached map depicting Fire, EMS and Public Safety facilities.)

### Recreation

The City Parks and Recreation Department for the City of Newberry is located on College Street next to City Hall. Table F-14 lists the parks in the city. (See map depicting location of parks and government facilities.)

#### TABLE F-14

### PARKS AND RECREATION FACILITIES, CITY OF NEWBERRY Source: Consolidated Inventory of Regional Natural Resources and Infrastructure, Central Midlands Regional Planning Council, June, 1996

Park State	Acreage	Facilities	
J.D. Rook Ballfield	1	little league baseball field	
Kendall	12	concession stands, basketball courts, softball fields, picnic shelters	
Margarite Hunter	8	picnic shelters	
Marion Davis	11	playground, picnic shelters	
McSwain	5	multi-purpose courts, playground	
Mullohan	4	picnic shelters, playground	
Nosegay	0.5	picnic tables	
Oakland	4	concession stands, multi-purpose courts, playground, softball fields	
Vincent Street	3	multi-purpose courts, baseball field	
Wells	6	passive park	
Willowbrook	5	multi-purpose court, scout cabin	
Y Street	8	concession stands, playground, softball fields, basketball courts	
Lynch's Woods	331	Primitive natural area	

### Education

Table F-15 lists the schools in the City of Newberry. (See map depicting locations of schools and libraries.)



### TABLE F-15 INVENTORY OF SCHOOLS IN THE CITY OF NEWBERRY Source: <u>Consolidated Inventory of Regional Natural Resources and Infrastructure</u>, Central Midlands Regional Planning Council, June, 1996

School	Enrollment	Location	Grades
Boundary Elementary	485	1406 Boundary Street, Newberry	Pre K-3 and special education
Gallman Elementary	445	540 Brantley Street, Newberry	4-5 and special education
Newberry High	910	3113 Main Street, Newberry	9-12 and special education
Newberry Middle	752	1829 Nance Street, Newberry	6-8 and special education
Newberry Learning Center	58	3321 Main Street, Newberry	9-12
Newberry Career Center	687	3413 Main Street, Newberry	9-12
Speers Street Elementary	513	1121 Speers Street, Newberry	Pre K-3 and special education

Also located within the City of Newberry is Newberry Academy, which provides K3-12 education for students throughout Newberry County. Last year's enrollment was 85 students in K3 and 225 students in grades 1-12. Extensive expansion was done in 1994 which included enlarging the library, computer lab, and lunch room, the addition of two classrooms for kindergarten and two for 1-12, as well as building a new gym. Currently, there are no plans for any future expansion.

Other education is provided within the city through Newberry College, a fully accredited fouryear co-educational liberal arts college supported by the South Carolina, Southeastern, and

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Florida Synods of the Lutheran Church of America. The University of South Carolina, Columbia College, Allen University, Benedict College, Columbia Bible College, Lutheran Theological Seminary, Presbyterian College, Lander University, Piedmont Technical College and Midlands Technical College are additional institutions of higher education, all located within 40 miles of the city.

#### Library

The main branch of the Newberry County Library is located at 1300 Friend Street. The library had a circulation of 71,920 items in 1995. (See map depicting locations of schools and libraries.) Currently, there are no definite plans for expansion.

#### <u>Health</u>

There are no health facilities operated by the city. The Newberry County Health Department is located in the City of Newberry at 1308 Hunt Street. The department offers environmental health, family planning and WIC (women/infant care) services.

Newberry County Memorial Hospital is located at 2669 Kinard Street in the City of Newberry. The hospital has 102 bed and is currently doing renovations to the facility. The hospital has also developed a 5 year master plan for expansion, but no work has begun. There is 1 doctors' office associated with the hospital.

#### Social Services

There are no social services facilities operated by the city. The Department of Social Services is located in the City of Newberry at 1308 Hunt Street. The department handles abuse cases and other related functions.

#### **Other Services**

City Hall is located at 1330 College Street. In addition to the services described above, the city also has:

- A Finance Department primarily responsible for collecting, disbursing and accounting for all city funds.
- A Personnel Department which plans and directs activities, personnel and operations of the city, including the City Clerk duties; and
- A Building and Zoning Department which is responsible for administering the various construction codes adopted by the city and for enforcing the city's Zoning Ordinance.

#### 2 Needs and Goals

The City of Newberry is well administered, organized and operated. All departments provide efficient and effective services. An overall need and goal is for the city to maintain its current effective and efficient operation. The following needs and goal are proposed for the community facilities operated in the city.

- Roads:
  - The city should endorse the road improvements proposed in the State Transportation Improvement Plan
  - The city should implement the improvement to the downtown streets proposed in the master plan
  - the city should continue the street maintenance program

Water Supply, Treatment and Distribution: The city should encourage the development of a regional water provider to enhance service in the county, especially along the I-26 interchanges.

- Sewer Collection System and Sewage Treatment: Due to concerns of the Bush River, the city should encourage the development of a regional sewer system as proposed by the Newberry County Water and Sewer Authority.
- Solid Waste: Study the possibility of adding a recycling program to the existing high level of service.
- Police Protection: Continue existing programs of crime deterrence, prevention, and apprehension
- Fire Protection: Continue existing programs of fire prevention, suppression and education.
- Building Codes:
  - Participate in a county-wide consolidated enforcement program operated by Newberry County
  - Update subdivision regulations to include land development requirements for all land development to conform to the 1994 Planning Enabling Legislation.
- Recreation: Continue existing program of services
- General: Prepare and adopt a Long Range (6-10 year) Capital Improvements Program detailing major expenditure needs of al city activities and Comprehensive Plan implementation projects.

#### 3 Implementation Strategy

Implementation strategies and time frames for achieving the community facilities element goals are included in Chapter Eight of this Comprehensive Plan.

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# APPENDIX A NEWBERRY COUNTY WATER AND SEWER AUTHORITY RATE SCHEDULE

### Source: Newberry County Water and Sewer Authority

#### I. Water Policy

### Schedule A: Residential

The basic minimum residential water rate is \$14 per month unless the minimum is increased due to a special contract for certain meters or as shown in Schedule D.

Including and in addition to the basic minimum water rate, the following graduated schedule of charges apply:

Gallons	Rate/1000 Gallons	Total Cost	<b>Total Gallons</b>
First 1,000	\$14	\$14	1,000
Next 1,000	\$6.75	\$20.75	2,000
Next 1,000	\$5.75	\$26.50	3,000
Over 3,000	\$4.75		

#### Schedule B: Commercial:

The basic minimum commercial water rate is \$19 per month unless the minimum is increased due to a special contract for certain meters or as shown in Schedule D.

Gallons	Rate	Total Cost	Total Gallons
First 1,000	\$19.00	\$19.00	1,000
Next 2,000	\$5.75	\$30.50	3,000
Next 2,000	\$4.75	\$40.00	5,000
Next 5,000	\$4.75	\$63.75	10,000
Next 15,000	\$4.75	\$135.00	25,000
All over 25,000	\$4.75		·

#### Schedule C. Industrial:

The basic minimum charge and usage for any industrial customer shall be \$192.00 for a minimum of 50,000 gallons. An industrial rate schedule is established base on the reservation of available supplies as follows.

Gallons	Rate Per 1,000	
First 50,000	\$3.84	
Next 100,000	\$3.28	
Next 100,000	\$3.13	
Next 250,000	\$2.78	
Next 500,000	\$2.52	
All over 1,000,000	\$1.92	

Individual Contracts and reservation of available supplies result in a minimum consumption and bill for the following industries:

Industry	Minimum Rate	<b>Minimum Gallons</b>
Kayser-Roth	\$3,360.00	1,750,000
Thompson	\$1,920.00	1,000,000
State Park	\$1,180.00	375,000
G-P Chip Mill	\$356.00	100,000
Setlowear	\$192.00	50,000
Carter Nursery	\$192.00	50,000
I-26 Rest Area	\$755.00	225,000
Georgia-Pacific	\$3,840.00	2,000,000
Special Commercial	Minimum Rate	Minimum Gallons
Federal Paper Board	\$529.00	100,000
Mid-Carolina Sr. High	\$356.00	100,000
Mid-Carolina Jr. High	\$356.00	100,000

#### Stand-By Agricultural Rate:

Large agricultural users whose operations are entirely agricultural in nature may be granted a Stand-By Agricultural Rate status. This rate shall be one half the minimum monthly Industrial or Commercial charge for whatever size meter is installed for all months with zero consumption. Any month in which water is used shall be billed at the regular Industrial or commercial rate and minimums established for that particular meter size. In order to qualify for this rate, a written request must be made to the Manager of the Authority, who will investigate each request in order to verify that the operation is purely agricultural in nature and respond to the customer in writing.

Schedule D Other:

1. Bulk Water Sales:

Water purchased from fire hydrants shall be prior approved by the Authority and shall be temporarily metered and delivered at a rate of \$4.20 per 1,000 gallons.

#### 2. Minimum Monthly Charges:

Meter Size	Residential	Commercial	<b>Gallons Per Month</b>
5.8"x3.4"	\$14.00	\$19.00	1,000
1"	\$37.75	\$40.00	5,000
1 1/2"	\$61.50	\$63.75	10,000
2"	\$132.75	\$135.00	25,000

Meters larger than 2" and compound meters are to be negotiated.

### 3. Travel Trailer Parks.

Rates are based on the Commercial Rate Schedule, plus \$1.50 per trailer space.

### 4. Mobile Home Parks

Rates for mobile home parks with Master Meters shall be based on the Commercial Rate Schedule plus \$4.40 per mobile home site occupied at the time of the meter reading. Mobile home parks with homes on individual meters shall be based on the Residential Rate Schedule.

#### Stand-By Mobile Home Park Rate:

Mobile home parks with twenty-five or more spaces rented may be granted a Stand-by Mobile Home Park Rate when they have their own will system for normal use. For any month with zero consumption, this rate will be the minimum commercial rate for the particular meter size plus one dollar (\$1.00) charge for each mobile home space in the park. Any month in which water is used shall be billed at the regular commercial rate and the minimum established for that particular meter size. In order to qualify for this rate, a written request must be made to the Manager of the Authority, who will investigate each request in order to verify that the connection poses no threat or danger to the NCWSA water system and meets all established specifications and standards. Copies of the request and reply of any will be filled with the customer's Water User Agreement.

#### 5. Fire Hydrants:

Fire hydrants placed on private property at the request of property owners are subject to a \$50.00 per year rental fee in addition to the material and installation cost. Failure to pay the rental fee will result in permanent removal of the fire hydrant. Fire hydrants requested by the County Fire Board or placed on public right-of-ways are subject to a \$25.00 per year rental fee in addition to the materials

and installation cost.

#### 6. Sprinkler Charge:

1-25	Sprinkler Heads
26-50	Sprinkler Heads
51-100	Sprinkler Heads
101-500	Sprinkler Heads
501-999	Sprinkler Heads
1,000-5,000	Sprinkler Heads
over 5,000	Sprinkler Heads

\$125.00 per year
\$225.00 per year
\$325.00 per year
\$1.75 per head over 100/year
\$.86 per head over 500/year
\$.45 per head over 1,000/year
\$.25 per head plus \$2,000/year

#### II Sewer Policy

#### Schedule A: Residential and Commercial

Sewer charges for customers having both water and sewer services shall be based on the amount of water metered each month at a rate of \$3.15 per thousand gallons with a minimum residential usage of 5,000 gallons and a minimum commercial usage of 10,000 gallons. The minimum residential bill will be \$17.60 and the minimum commercial bill will be \$35.20. In the case where a customer has only sewer service, the charge will be based on a flat rate of \$28.75.

#### Schedule B: Industrial

The quantity and quality of industrial wastes discharged varies and the rate charged large customers shall be no less than \$3.15 per thousand gallons except by special contract and shall be based on the following minimum flows. (Additional Industrial Pretreatment charges may apply to individual industry based on separate policy of the Board of Directors of the Authority.)

Minimum Rate	<b>Minimum Gallons</b>
\$3,318.65	1,035,538
\$2,867.03	910,169
\$9,671.36	3,070,274
	Minimum Rate \$3,318.65 \$2,867.03 \$9,671.36

Special Industry	Minimum Rate	Minimum Gallons
Georgia-Pacific	\$2,054.00	456,000
Special Commercial	Minimum Rate	Minimum Gallons

Special Commercial	Minimum Rate	Minimum Gallor
Federal Paper Board	\$552.00	100,000



Mid-Carolina Sr. High	\$552.00
Mid-Carolina Jr. High	\$552.00
I-26 Rest Area	\$709.00

100,000 100,000 225,000

### TRAFFIC COUNT MAP

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# TRAFFIC COUNT MAP

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## TRAFFIC COUNT MAP

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# TRAFFIC COUNT MAP

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MAP OF ROAD CLASSIFICATIONS

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### MAP OF WATER SYSTEM

Revised 11/12/98

# Revised 11/12/98

MAP OF SEWER SYSTEM

# MAP OF GAS SYSTEM

MAP OF FIRE, EMS, AND PUBLIC SAFETY

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MAP OF PARKS AND GOVERNMENT FACILITIES

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MAP OF SCHOOLS AND LIBRARIES