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MCDUFFIE,M.A. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation

SUBJECT: Forwards info re Harris-Harnett segment of offsite transmission line,identifying major environ features considered in selecting route for 500 kV line.

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CP&L

Carolina Power & Light Company

December 21, 1979

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D.C. 20555

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NOS. 1, 2, 3, AND 4
DOCKET NOS. 50-400, 50-401, 50-402, AND 50-403
HARRIS-HARNETT 500 kV LINE

Dear Mr. Denton:

The construction permit for the Shearon Harris Nuclear Power Plant (SHNPP) was issued January 27, 1978. One of the conditions of this permit is that Carolina Power & Light Company (CP&L) must submit descriptions of the route and the immediate environs of the Harris-Erwin (now named the Harris-Harnett) segment of the off-site transmission line to the staff for review and approval prior to the initiation of construction of the line.

The attached report identifies the major environmental features considered in selecting the proposed route for the Harris-Harnett 500 kV Line. Please advise us of your concurrence with the proposed route so construction of this line may proceed.

Yours very truly,

M. A. McDuffie
Senior Vice President
Engineering & Construction

SDF/jcb

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ES
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411 Fayetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

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1.0 PROJECT DESCRIPTION

The Harris-Harnett 500 kV Line has three 1590 MCM ACSR conductors per phase which yields a normal and emergency load capacity of 4025 MVA. A typical span length is 1,200 feet with a minimum ground clearance of 36 feet. The typical structure will be the rusted brown steel lattice tower ("Cor-ten" or equivalent).

1.1 TRANSMISSION RIGHTS-OF-WAY

1.1.2 General Description

The Harris-Harnett 500 kV Line extends from the SHNPP 500 kV Switchyard to the Harnett 500 kV Substation, a distance of 27.8 miles (Figure 1.0-1). The line will be constructed on a 180-foot-wide corridor and will require 607 acres of right-of-way.

1.1.3 Land Adjacent to Right-of-Way

The terrain adjacent to the Harris-Harnett Line is gently sloping to flat. The present land use is primarily agricultural with some timber production and surface mining interspersed between small rural communities. The land use is expected to change very little in the foreseeable future. However, some population growth is expected around the towns of Lillington, Fuquay-Varina, and Buies Creek.

The major vegetation components along the proposed route are a mosaic of agricultural fields, cutover forests, pine plantations, and various pine-hardwood and hardwood forest, all typical of the upper Coastal Plain and lower Piedmont physiographic provinces. The northern one-quarter of the route (Piedmont) is dominated by second and third growth pine and pine-hardwood forests. The southern three-quarters of the route (Coastal Plain) is dominated by agricultural fields interpersed between small bands of bottomland forests associated with streams of the Cape Fear drainage system.

Only 150 feet of the 180-foot-wide right-of-way will be totally cleared. This accounts for the clearing of 103 acres in the Piedmont and 213 acres in the Coastal Plain Physiographic Regions. Therefore, approximately 316 acres of total clearing is expected.

The Harris-Harnett Line will cross 5 primary and 28 secondary roads. The primary roads crossed are U.S. 401, N.C. 42, N.C. 55, N.C. 27, and N.C. 210. Where natural vegetation exists, a vista screen will be maintained on these primary roads.

The Harris-Harnett Line crosses three railroads. Prior to construction, permits will be obtained for each crossing, and line clearance will meet or exceed National Electrical Safety Code requirements.

The Harris-Harnett Line crosses six minor streams and eight farm ponds. A buffer zone of natural vegetation will be retained, where feasible, that will prevent erosion on the stream or pond bank. There are no navigable stream or river crossings.

The Harris-Harnett Line crosses no known archeological, historical, or recreational sites nor does the line impact any threatened or endangered species.

The Harris-Harnett Line presents no hazard to aerial navigation. All structures are designed well within the 200-foot vertical regulation of the Federal Aviation Administration guidelines entitled "Objects Affecting Navigable Airspace". Also, the proposed line is not located near any approach zones to the area's airports.

2.0 HARRIS-HARNETT ALTERNATIVES

This section provides a description and evaluation of the Harris-Harnett 500 kV alternative routes. Costs and environmental effects associated with each alternative are also included.

A more detailed description of the selected route, Alternative 2, is provided in Section 1.0. The route was selected after careful evaluation and represents the most favorable route based on environmental impact, cost, and system operation.

2.1 ALTERNATIVE ROUTES

Alternates 1-4 are shown on Figure 2.0-1 and are identified as follows:

Alternative 1	SHNPP-A-B-C-Harnett 500 kV Substation
Alternative 2	SHNPP-A-D-C-Harnett 500 kV Substation
Alternative 3	SHNPP-E-D-C-Harnett 500 kV Substation
Alternative 4	SHNPP-E-Harnett 500 kV Substation

Alternatives 1 and 2 parallel the existing Harris-Erwin North 230 kV Line to a point approximately 2 miles west of Fuquay-Varina. At this point, both alternatives turn southeastward and continue to Point A. Alternative 1 continues to Point B, then turns eastward and passes through Point C, continuing to its terminus at the Harnett 500 kV Substation. Alternative 2 leaves Point A, extends southeastward through Point D to Point C, where it rejoins Alternative 1, and continues to the Harnett 500 kV Substation site.

Alternatives 3 and 4 extend southward from the SHNPP to Point E, approximately one mile east of Corinth. At this point, Alternative 3 turns east-southeastward to Point D, where it rejoins Alternative 2 and continues to the Harnett 500 kV Substation site. Alternative 4 extends southeastward from Point E, passes between Buies Creek and Coats, and terminates at the Harnett 500 kV Substation site.

2.2 COMPARISON OF ALTERNATIVES

The alternative route comparison is given in Table 2.0-1 and discussed below:

Alternatives 1 and 2 follow the same route, except where Alternative 1 extends from Point A to Point C. Alternative 1 is 1.1 miles longer than the selected route (Alternative 2), crosses more streams, and presents a higher soil erosion potential. Alternative 1's major impact is the amount (6,200 feet) of wetlands traversed. The wetland location is necessary to maintain adequate distances from occupied dwellings.

Alternatives 3 and 4 share the same route from the SHNPP to Point E. This segment passes near several known archaeological sites, and depending on tower locations, could disturb one or more of these sites. Alternative 3 extends eastward from Point E to Point D where it shares a common location with Alternative 2. The E-D segment of Alternative 3 traverses 5.8 miles of critical wild turkey habitat, makes two additional crossings of North Carolina Highway 42 and crosses 17.5 miles of forested lands. Alternative 3 is the longest and most expensive route, and visually impacts one historic site.

Alternative 4 extends from Point E to the Harnett 500 kV Substation site without sharing a common corridor. This alternative is 3.1 miles longer than the selected route, would pass through 8 miles of critical wild turkey habitat, and has the highest potential for soil erosion. Also, this alternative would visually impact Raven Rock State Park located adjacent to the Cape Fear River.

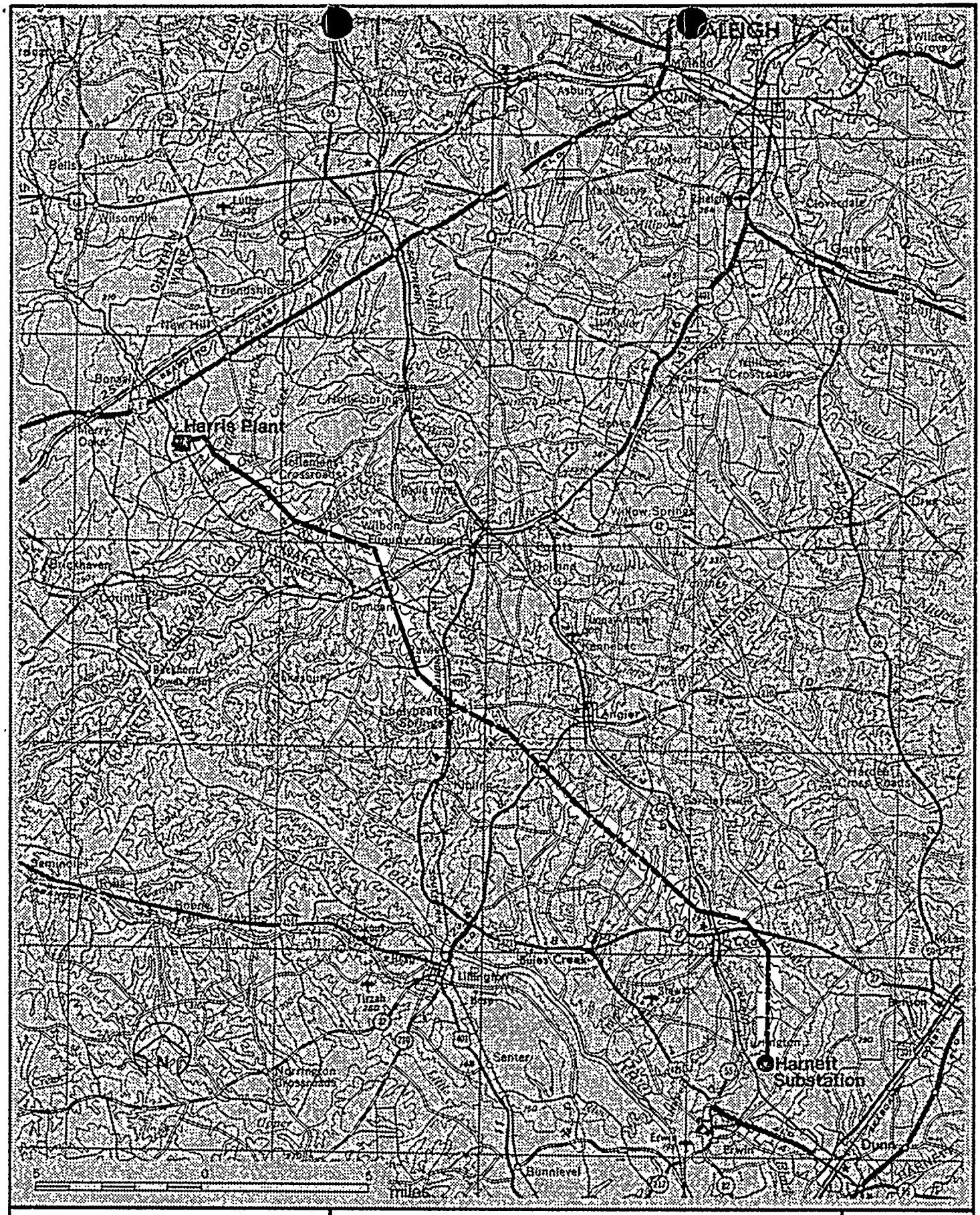
Table 2.0-1 COST AND ENVIRONMENTAL EFFECTS COMPARISON OF THE PROPOSED HARRIS-HARNETT 500 kV LINE ALTERNATIVES

Criterion	Alternative			
	1	2 (Selected)	3	4
Estimated Cost (1979 Dollars)	$11,390,000	$11,340,000	$12,920,000	$12,470,000
Length (Miles)	28.9	27.8	32.4	30.9
Forests (Acres)	331	316	382	335
Potential Soil Loss if Left Unrecovered (Ton/Year)	3846	3008	3834	10,644
Stream Crossings	12	6	10	14
Wetlands Traversed (Feet)	6200	1300	2000	1400
Critical Turkey Habitat (Miles)	0	0	5.8	8.0
Archaeological Sites Impacted	0	0	2	2
Historical Sites (Within 1/4 Mile)	0	0	0	1
Average Daily Traffic Volume at Major Road Crossings (Vehicles)	13,350	12,500	12,210	11,510
Major Road Crossings	1 Federal, 4 State	1 Federal, 4 State	1 Federal, 6 State	1 Federal, 6 State
Common Right-of-Way (Miles)	5.5	5.5	0.8	2.1

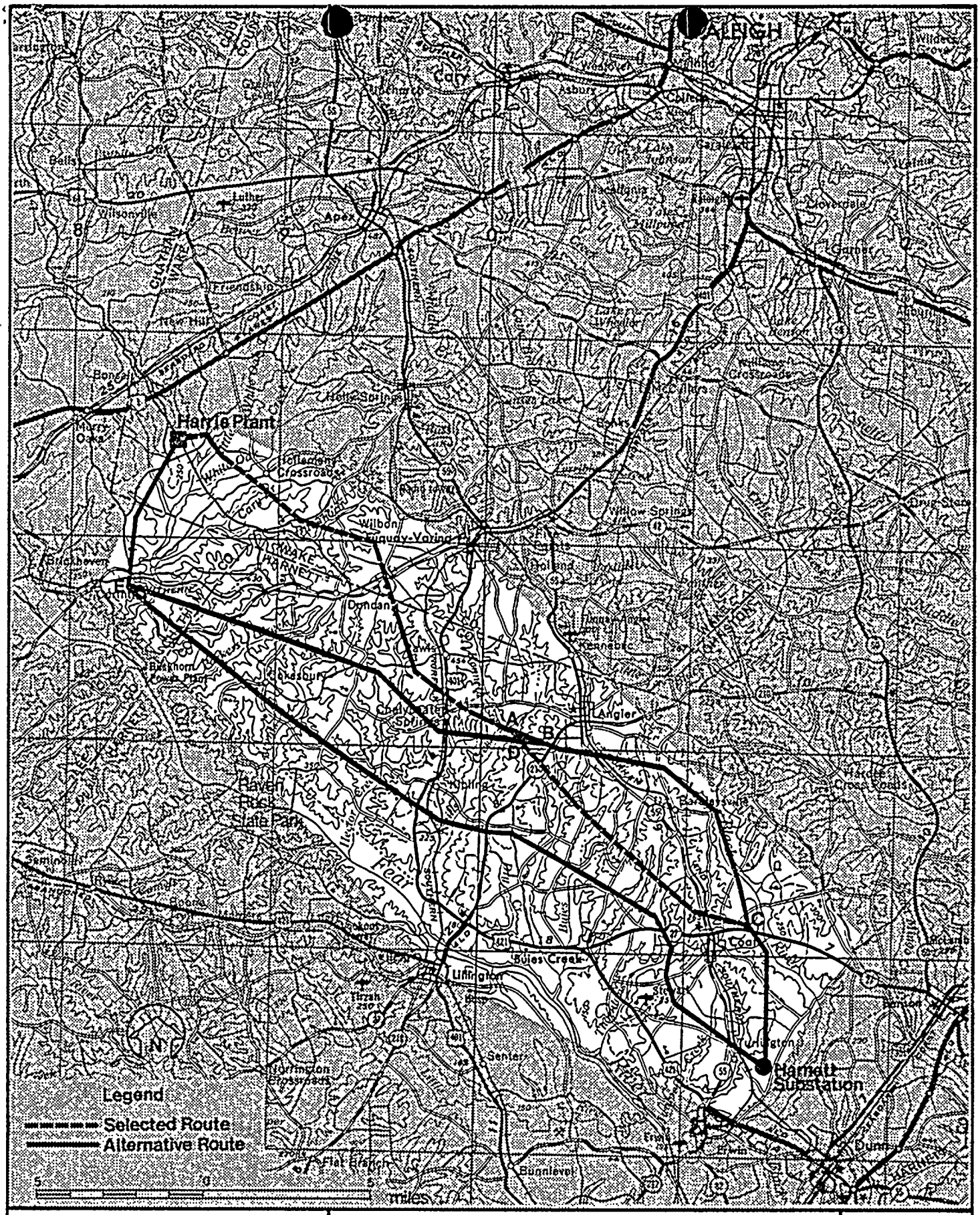
2.3. CONCLUSION

After careful evaluation and consideration of NRC testamony, Alternative 2 was selected as the most favorable route. The most important assets of Alternative 2 are listed below:

Minimum Length
Minimum Construction Cost
Maximum Access for Construction
No Historical or Known Archaeological Sites Impacted
Minimum Right-of-Way Clearing
Lowest Potential for Soil Erosion
Fewest Stream Crossings
Minimum Length through Wetlands
No Critical Wild Turkey Habitat or State Gamelands Impacted
Highest Potential for Screening Road Crossings
Maximum Length of Common Right-of-Way with other Facilities
No Known Impacts to Threatened or Endangered Species
No Impact to Cape Fear River



SHEARON HARRIS NUCLEAR POWER PLANT Carolina Power & Light Company	HARRIS-HARNETT 500kv LINE	FIGURE 1.0-1



SHEARON HARRIS NUCLEAR POWER PLANT Carolina Power & Light Company	HARRIS–HARNETT 500kv STUDY AREA	FIGURE 2.0-1