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Timberlake New Community: Environmental Statement

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TENNESSEE VALLEY AUTHORITY
ENVIRONMENTAL
STATEMENT

Water Quality Control Branch File
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TIMBERLAKE NEW COMMUNITY

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FINAL

TENNESSEE VALLEY AUTHORITY

TIMBERLAKE NEW COMMUNITY

Chattanooga, Tennessee
January 9, 1976

CONTENTS

	Page
Introduction	1
Description of the Project	2
I. Nature of the Proposal	2
II. Location of Site	2
III. Development Program and Plan	3
IV. Program Management	5
V. New Community Objectives	9
VI. National Demonstration Features	10
Description of Environment Affected	12
I. Natural and Physical	12
II. Socioeconomic Setting	21
III. Relationship to Regional Goals and Objectives	27
IV. Local Government Agencies with Related Planning and Zoning Responsibilities	31
Environmental Impact of the Proposed Action	33
I. Impact on Natural Environment	33
II. Socioeconomic Impact	46
Adverse Environmental Effects that Cannot be Avoided Should the Proposal be Implemented	62
Alternatives to the Proposed Action	63
Relationship Between Local, Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity	66
Irreversible and Irretrievable Commitments of Resources That Would Be Involved in the Proposed Action Should it be Implemented	67
Footnotes	68
Appendix A	
Appendix B	
Appendix C	
Appendix D	

SUMMARY SHEET
ENVIRONMENTAL STATEMENT
TIMBERLAKE NEW COMMUNITY

() Draft (X) Final

Draft Environmental Statement prepared by the Tennessee Valley Authority. For additional information contact: Peter A. Krenkel, Director, Division of Environmental Planning, 206 401 Building, Chattanooga, Tennessee 37401. Telephone: (615) 755-3161.

1. (X) Administrative action () Legislative action
2. The proposed action is the development of a new community of about 30,000 population on the shorelands of the Tellico Reservoir in Loudon and Monroe Counties, Tennessee. The new community, to be known as Timberlake, would provide an opportunity to determine how a planned community of high quality would serve to stimulate and promote social opportunities and economic growth of a region which has been characterized by low income and underutilization of human and natural resources. The general development concept anticipates a sponsorship by the Tennessee Valley Authority with optimum participation by the private sector in planning and developing the new community.
3. The new community will provide industrial job opportunities and residential and commercial development in an area characterized by underemployment and outmigration of the population. Adverse impacts which cannot be avoided are foregoing the harvesting of about 17 million board feet of merchantable sawtimber and its future sustained production; minor impact on waterfowl through lost feeding opportunities; decrease in the upland game presently on the Timberlake site through lost habitat and disturbance; gradual reduction of acreage licensed for short-term agricultural related uses; restriction of hunting; some erosion; potential minor amounts of pollution of the Tellico Reservoir from fuel spills and possibly cargo during transfer to and from barges; possible undesirable land conversion pressures on adjacent lands; and potential air, noise and transportation modifications inherent to building and functioning of an urban place of 30,000 people.

4. Alternatives considered include: industrial development; public and commercial recreational development; public recreational development; residential subdivisions development; and no development.
5. Comments have been received from the following Federal, state, and local agencies:
Departments of:
 - Agriculture
 - Commerce
 - Health, Education and Welfare
 - Housing and Urban Development
 - Interior
 - TransportationEnvironmental Protection Agency
Federal Energy Administration
Tennessee Office of Urban and Federal Affairs
East Tennessee Development District
6. The draft statement was sent to the Council on Environmental Quality and made available to the public on November 29, 1974. The final statement was sent to the Council on Environmental Quality and made available to the public on January 9, 1976.

TIMBERLAKE NEW COMMUNITY

Introduction

TVA proposes to sponsor and participate in the planning and development of a new community which would provide a high quality living, working and recreational environment for about 30,000 residents. The community, to be known as Timberlake,¹ would serve as a demonstration of planned land use and economic opportunity and of the provision of urban services to an essentially rural area which is expected to undergo rapid and far-reaching change.

The community would be located on the shorelands of Tellico Reservoir, a 16,500 acre impoundment on the Little Tennessee River, which is scheduled for completion in 1977.² In planning for the use of the shorelands that it will acquire as part of the Tellico Project, TVA has cooperated with the Tellico Area Planning Council,³ an organization comprised of citizens and elected officials from the three counties in which the reservoir is located. A general land-use plan has been developed for the area surrounding the reservoir which provides the setting for Timberlake.

In order to implement the concept, TVA believes that optimum participation by the private sector is important. Two basic alternative approaches to a cooperative public and private effort are under consideration by TVA: (1) a partnership with a private "master" developer having substantial management and financial resources which would enable the company to assume major planning, development, and management responsibilities over the entire project development period,⁴ or (2) an undertaking with several smaller developers who individually would not have the resources to serve as a "master" developer. In TVA's judgment, either arrangement would produce satisfactory results and would be a significant prototype for future public-private ventures; therefore, TVA considers both approaches viable future options.

The descriptions and discussions of the effects of Timberlake in this environmental statement are based on the feasibility studies and planning accomplished to date. Environmental considerations will continue to be taken into account as more detailed plans for specific phases of the program are developed. Appendix C contains a list of

references to various documents, reports, and materials which have been prepared as part of the planning process, or which are relevant to the project.

DESCRIPTION OF THE PROJECT

I. NATURE OF THE PROPOSAL

The Urban Growth and New Community Development Act of 1970; the Rural Development Act of 1972; and the Housing and Community Development Act of 1974 establish a Federal policy of promoting a better living environment for all citizens. In furtherance of this policy and pursuant to the Tennessee Valley Authority Act of 1933, TVA proposes to sponsor and participate in the planning and development of a new community on the shorelands of Tellico Reservoir in East Tennessee. The development program provides for the construction over a 20-year period of a comprehensively planned new community of about 30,000 residents in Loudon and Monroe Counties, Tennessee.

II. LOCATION OF SITE

The Timberlake site is located in the low, parallel ridges and gently rolling valleys of Loudon and Monroe Counties, approximately 30 miles southwest of the Knoxville metropolitan area, which has a population of over 400,000. Figure 1 shows the location of the site in relation to the Knoxville Standard Metropolitan Statistical Area⁵ (SMSA) and other nearby communities.

As shown in figure 2, the site is readily accessible to major highway, rail, and air transportation services. Interstate Highways 40 and 75 pass a few miles north of Timberlake and can be reached from the new community via Tennessee State Highway 72, which also connects with the Foothills Parkway. Approximately 20 miles of Highway 72 and the Tellico Parkway will be newly constructed upon completion of the Tellico Project. U.S. Highway 411 passes through the site, as does the main line of the Louisville and Nashville Railroad. The Knoxville Municipal Airport is approximately 20 miles northeast via U.S. Highway 411. After completion of the Tellico project, a 9-foot commercially navigable waterway will connect Timberlake with the Interconnected Inland Waterway System. A public port facility site will be located on the southwest (left) bank of the reservoir just north of the U.S. Highway 411 bridge.

Approximately 16,000 acres of the 21,000 acres of shorelands along the Tellico Reservoir will be available for development of Timberlake. The remaining acreage will be reserved for use as dam reservation, buffer zones and other compatible uses around the reservoir. The relationship of the site to the Tellico Reservoir, which extends 33 miles along the Little Tennessee River Valley to Chilhowee Dam⁶ and the Cherokee National Forest, is shown in figure 3. It is near the Great Smoky Mountains National Park.

III. DEVELOPMENT PROGRAM AND PLAN

Timberlake provides an opportunity to create a community of high quality and to stimulate the regional economy. As a planned environment, Timberlake's community facilities and functions will be integrated with the land and water resources of the site and area. The development program is projected to continue over approximately a 20-year period, and the rate of development is expected to be maintained at a comparatively uniform pace within projected 5-year phases. The projected development program proposed for Timberlake is shown in table 1. The general land use plan is shown on figure 4.

Present projections are for approximately 11,000 units of sales and rental housing to be built in villages consisting of 1,200 to 2,500 units within Timberlake over the 20-year development period. The overall residential density, as presently planned, will be about five units per gross acre of residential land. Single-family units might comprise about two-thirds of all dwelling units. Consultant studies indicate that about 42 percent of the housing could be rental units and that about 15 percent might be subsidized.⁷

The new community will be comprised of villages containing several year-round or seasonal residential neighborhoods. The villages will be served by commercial facilities, community playgrounds and parks, and schools. Housing will range from single-family dwellings to higher density development, providing for a variety of architectural style and price, and will be grouped in clusters in the villages and neighborhoods.

Trees and open space will separate the clusters of housing. Throughout the community will be a planned open space system linking together the various activity centers. The system shall be an integral part of and complementary to the community plan and shall include

pedestrian ways, pathways, bicycle and horse trails, rights of way, buffer zones, the reservoir and shoreline, land with special natural and physical features, wilderness or conservation areas, utility easements, drainageways, historic sites and buildings, selected wildlife management and forested areas, scenic overlooks, and other appropriate land areas and features as may be identified. Automobile traffic will be isolated from pedestrian and play areas, and limited access streets and highways will carry traffic through and around the town.

Because of its location with respect to Tellico Reservoir and its nearness to the Cherokee National Forest, Great Smoky Mountains National Park, and other tourist attractions, Timberlake has significant potential for commercial recreation development. It is estimated that a market of 1.2 million visitor-days per year will exist in 1975 which could grow to over 2.0 million during the subsequent 20-year period.⁸ To realize this potential, the development program will devote about 3,700 acres to public and private recreational purposes including marinas, resort-lodge-cabin complexes, camping areas, nature and hiking trails, natural and historic areas, parks, second homes, and supporting commercial services and accommodations.⁹ The State of Tennessee has considered building a state park in this area¹⁰ on land which TVA would make available for this purpose. TVA will provide 15 public use areas for recreational access to the reservoir. In addition, TVA will provide neighborhood-oriented lake access points to service residents of Timberlake as the community develops. The public and commercial recreational opportunities planned for Timberlake should complement efforts to reduce demand for high-density recreation activities within the Great Smoky Mountains National Park and the Cherokee National Forest.

Development of a major waterfront industrial complex is planned at Timberlake. As this complex develops, it will provide a sustaining industrial employment base and broaden job selection opportunities for the area. It is forecast that new industrial employment opportunities could provide a net addition of 4,000 to 6,000 jobs during the 20-year development period.¹¹ Some 4,000 acres of land, most of which is served by highway, rail, and barge facilities, will be available for industrial sites and related activities. Industries will be required by TVA to conform to a land-use plan which will be developed so that upon completion

the plant sites will be compatible with the rest of the community. Plans for each industrial plant seeking to locate at Timberlake will be reviewed to ensure that they satisfy all requirements of the project as well as the applicable Federal, state, and local requirements respecting environmental quality.

Provision of services to Timberlake should provide opportunities for combining comprehensive urban planning with technological innovations to attain maximum benefit for the resident user and to reduce the impact of the development activities on the natural environment. It is premature to identify specific proposals that would be implemented at Timberlake; however, several possibilities have been identified during the initial planning effort, including the use of integrated utilities systems to provide steam and electrical power, use of treated wastewater effluents to scrub gas emissions or for cooling water, and use of wastes from one industry to neutralize another industry's wastes. Advanced telecommunication systems could be used for normal urban communication and data transfer, control of surface transportation, security monitoring and surveillance, and utility system operation and management. Innovations in the location, distribution, and installation of public utilities are possible for application at Timberlake. Planners will continue to identify opportunities where technology could be used to provide a better living environment within Timberlake.

IV. PROGRAM MANAGEMENT

There are several specific management aspects of the proposed development program that are designed to ensure that environmental as well as social, economic, and cultural factors are considered throughout the development period.

A. Planning and Development Approach

1. The Process. Accomplishment of the new community objectives requires the planning for Timberlake to be carried out in a manner permitting early decisions to be made without foreclosing future desirable program options.¹² To be effective, the planning and development process must be dynamic and flexible to change with new information, economic conditions, and inputs from citizen participation. Therefore, the detailed planning, design, and construction of Timberlake will be accomplished

according to a series of project development plans. Project development plans will consist of the following components:

(1) A General Plan which will provide overall principal direction and project management methods throughout the period of project development. The plan will describe project standards and guidelines, identify projected overall land-use alternatives; describe market, costs, schedule, and site conditions; describe financial policies and controls; identify and establish environmental protection policies and procedures, and design, development, construction, and property management techniques; and specify criteria for Project-Stage and Annual Plans.

(2) Project-Stage Plans, prepared in accordance with the General Plan, will cover logical increments of the project development period and will establish project goals, physical plans, and activities and responsibilities for specific periods of time.

(3) Annual Plans will cover the detailed activities and budgets required to accomplish the Project-Stage plans during each year.

Each stage will be designed to complement the development already completed and the approach to decision making will allow planners to pursue a development strategy that will strike a balance between short- and long-term economic, social, and environmental opportunities and goals. Greatest emphasis will be placed on defining key short-term decisions that will permit consideration of a maximum number of viable long-range program alternatives. During the implementation of each development phase, alternatives for the following phase will be prepared and evaluated.

2. Public-Private Developer Relationship. A principal advantage of direct public involvement in developing the new community is the assurance that commitment to long-term environmental and other quality objectives will not be abandoned for short-term advantages. TVA will cooperate with state and local governments and other public agencies to establish reasonable

development policies, guidelines, and environmental standards; and to identify all applicable public regulations, policies, and codes governing the development construction. TVA will assume a responsibility for monitoring compliance by the private sector and other participants with these standards to ensure the project will have a minimal detrimental effect on the environment. In addition, governmental jurisdictions will be encouraged to adopt reasonable development policies and environmental standards for areas near the new community site to prevent disorderly development and undesirable environmental conditions.

3. Planning Activities and Governmental Coordination. During the preliminary planning studies for Timberlake, TVA endeavored to maintain close cooperation and coordination of its activities with various Federal agencies and state and local governments and organizations. In mid-1971, a project advisory board was formed as a vehicle for providing an opportunity for these agencies and organizations to participate in planning reviews of Timberlake. The Timberlake Advisory Board¹³ provides the opportunity for future broad-based involvement of many elements of government and various agencies during the development period. A prime objective of the development will be to produce a high quality community environment. To pursue this, the planning will be developed in close collaboration with an interdisciplinary team of TVA personnel, outside organizations,¹⁴ consultants, and the Timberlake Advisory Board. In addition to the interdisciplinary, interagency reviews provided by the Timberlake Advisory Board, an advisory panel will be formed of nationally recognized experts to provide broad expert guidance to ensure that the individual development choices and activities will together produce a viable community.

B. Site Analysis

TVA will require all planning and design preceding major development phases to take into account the potential impact on the site. Detailed physiographic information will be used in this analysis to identify land capabilities and ecological

impacts. An overview analysis of site suitability has been developed by TVA for use in identifying alternative land use possibilities.

C. Public Control of Land Base

TVA will have initial custody and control of the land base, and this control will be used as an instrument to guide the development. This will allow the realization of economies through reasonably priced land without speculative cost escalation, and through the efficiencies inherent in large-scale development. The control of the land base by a single public agency will provide a simplified and more flexible approach in making it available for development as well as assuring the various developments are compatible with each other.

TVA will retain control of certain shorelines acreage and other areas to be identified during the planning process in order to preserve them as open space. These areas may later be transferred to the community or other public entity in a manner to ensure their continued use for that purpose.

D. Industrial Development Objectives

Certain industrial development objectives have been identified which are designed to be complementary to the development of the new community. Industries locating at Timberlake will become a part of and share in the benefits of the unified management approach to total community development. Unified management will permit orderly development, which should demonstrate that it is possible for large-scale industrial development to take place and be environmentally compatible with the residential and recreational activities. Industries that provide opportunities for increased income, a stable employment base, and potential for attracting skilled workers (although in the early years employing the existing labor pool), will be given priority.

It is not possible to predict which specific industries will decide to locate or consider locating at a given location within Timberlake. However, efforts have been made to identify those industries that might reasonably be expected to find the

Timberlake area a suitable geographical location. This task was done by evaluating each of the 4-digit categories of industries under the Standard Industrial Classification system as to their desirability for and attractability to the Timberlake location.¹⁷ The identified industries are shown in table 2. It is probable that certain other industries would also find the Timberlake location attractive. As one aspect of the program management, industrial research activities will continue during the development period to analyze industrial development opportunities.¹⁸

E. Developer Agreement

Agreements between TVA and other public and private developers will include a commitment by the parties to the goal of providing a living environment of high quality and accomplishing the development objectives in the public interest. The agreement would also provide for recognition by the parties of the commitments made in this environmental impact statement, which has been prepared in accordance with the National Environmental Policy Act of 1969 (P.L. 91-190).

V. NEW COMMUNITY OBJECTIVES

Within the framework for development of Timberlake, the objectives to be pursued and the plan for accomplishing them are as follows:

- (1) To foster community and regional economic opportunities by:
 - a. Creating opportunities for increased economic activity through optimum investment of private capital; and
 - b. Attaining an industrial mix that will have sufficient capital-intensive, high-wage industries and occupational diversity to provide area residents with enhanced employment opportunities and local governments with an increasing tax base.
- (2) To provide a choice of alternative life styles for those persons who would normally reside in predominantly rural nonfarm or sprawling suburban areas in the region by:
 - a. Providing a wide variety of housing types, sizes, and prices, all properly located with respect to their surroundings;

- b. Providing an efficient, well-planned, and integrated group of urban services that will meet the needs of the residents but be commensurate with the financial capability of the new community;
 - c. Providing for public ownership and maintenance of open space and path systems throughout the new community;
 - d. Creating ample opportunities for both passive and active recreation;
 - e. Creating a pleasing physical environment through good architectural design and overall orderly growth through implementation of sound community planning policies;
 - f. Ensuring that the planning, design, and construction of the new community gives full consideration to the ecology, natural beauty, and cultural significance of the area; and
 - g. Ensuring that industries located have the least detrimental effect on the natural environment and be acceptable in a model industrial park environment.
- (3) To provide opportunities for developing, enriching, and sustaining community and regional human resource potentials by supporting:
- a. The improvement of public educational and training program opportunities that exist in the area and the establishment of new ones for both children and adults;
 - b. The improvement of existing facilities in the area and the establishment of new ones to provide excellence in health services; and
 - c. The improvement of existing socio-cultural facilities and the establishment of others necessary to provide for the care and well-being of the area residents.
- (4) To provide opportunities for participation by the residents in decisions affecting their well-being.

VI. NATIONAL DEMONSTRATION FEATURES

A. Public-Private Developer

In the past, public participation in the development of new communities in the United States has been primarily in the form of Federal loan guarantees and supplementary grants.

Timberlake could become a test and demonstration of a partnership between the public and private sectors in building a balanced, well-planned new community. A joint public-private approach to planning, development, and marketing would bring together the special resources of each participant. A successful cooperative venture would lead to applying that experience to solving rural-urban problems in other regions.

B. Regional Growth Stimulus

The new community concept will be used to stimulate and improve the social and economic opportunities of a region which has been characterized by low incomes and underutilization of human and natural resources. Most new community projects are consequences rather than causes of economic growth. Timberlake is being planned as an integral part of the area in which it will be located, and its development will create a sustaining economic base by cultivating the area's industrial and recreational potentials. In addition to providing employment and housing opportunities, Timberlake can be the stimulus for generating a new citizen awareness of and enthusiasm for improved services and facilities in the area.

C. Energy Conservation and Technological Development

Timberlake offers the opportunity to study the relationship between the physical patterns of urban development and the consumption of energy and other resources. The project will provide for a comprehensive approach to identifying energy conservation techniques and developing technological solutions with the goal of minimizing the energy consumption of an entire community. Many of Timberlake's social and economic objectives are conducive to efficient energy utilization, as for example, grouping together the interacting community functions or the use of design and certain construction materials to achieve economies in operating costs of buildings and facilities.

Timberlake offers a wide range of opportunities for testing and implementing specific energy technology in community design. The feasibility of applying techniques such as the modular

integrated utilities system concept to low-density developments on the scale of 1,000 to 2,000 dwelling units will be investigated. Energy and conservation techniques also will be incorporated into the design and construction of all public buildings. Once implemented, these techniques can be studied in terms of consumer acceptability, needed technological refinements, and cost effectiveness. The resulting experience could then be used to help formulate future policies in the Nation with respect to energy consumption and conservation.

DESCRIPTION OF ENVIRONMENT AFFECTED

I. NATURAL AND PHYSICAL

A. Area Environment

1. Topography. The Timberlake site is comprised of two areas of significantly different topography. The section north of Notchy Creek ranges in elevation from 820 to 1,020 feet and, except for a single range of high hills called the Bat Creek and Red Knobs, is characterized by generally parallel low ridges and gently rolling to flat terrain. The ridges are aligned in a northeast-southwest direction. The topography south of Notchy Creek is more rugged and typical of the Appalachian Mountain region.

The mountains adjacent to the site rise from a base elevation of about 820 feet to an elevation of 2,700 feet above sea level. The valleys are narrow and steep-sided, and most of the ridges and spurs have sharp crests. A slope analysis of the Timberlake area is shown on figure 5.

2. Geology. The sedimentary rocks in the northern and southern sections of the site differ in age, structure, and composition. The rocks of the northern part are limestones, dolomites, shales and sandstones believed to have been deposited in relatively shallow, warm seas 300-500 million years ago during the Paleozoic era of geologic time. Most of the mountainous southern section is composed of older rocks, sandstones, siltstones, shales, and their altered equivalent, dating back 600 to 1,000 million years to the pre-Cambrian period. Both the

Paleozoic and pre-Cambrian rocks are folded and have been displaced westward for considerable distances along several major thrust faults. Because deeper weathering often is associated with the fault zones, adequate investigations and evaluations should be made for foundations of major structures in or adjacent to these zones. Generally, the residual soils and rock formations in the Timberlake area are capable of supporting typical two- or three- ton-per-square-foot loads imposed by residential, commercial, or light industrial structures. Exceptions to this are areas of sinkholes which should be avoided for even light structures. The occurrence of landslides is not a major problem, but minor slides could develop on the southeast flanks of ridges if artificial cuts in shallow overburden were made steeper than the slope of the bedding. Such cuts will be avoided. Figure 6 illustrates the geology of the area. The geographical region in which Timberlake will be located is classified as a Zone Two Seismic Risk¹⁷ earthquake zone. Studies of the East Tennessee area over the past 100 years by geologists of the U.S. Geological Survey, the Tennessee Division of Geology, TVA, and various universities have all reported that faults in the area are inactive and that no indication of displacement of the surface can be discovered.¹⁸

3. Soils. A soils association map for the Timberlake area has been prepared from information taken from TVA soil reports and published and unpublished surveys of the Soil Conservation Service. As shown on figure 7, several types of soils that occur together on the landscape have been grouped together into soils associations. Tables 3 and 4 describe the properties and limitations of these soils on an individual series basis.

4. Minerals. There is no current production of metallic or nonmetallic minerals on the Timberlake site except some sand and gravel from the Little Tennessee River. Two minerals found in the project area are limestone and dolomite. Intermittent leasing, geochemical exploration, and drilling for

zinc ore in the Timberlake area have been conducted in past years by both public and private interests.¹⁹ A minor deposit of zinc ore (sphalerite) has been located by private interests along Fork Creek near Eve Mills which is about two miles west of the Timberlake site. (see Geology Map, figure 6) Exploratory drilling indicated that occurrences of zinc ore are confined to long, narrow shoots, which are not of a quantity and quality to justify establishment of mining operations under present economic conditions. Some "marble" occurs in the bed of the Chickamauga limestone northwest of Bat Creek and Red Knobs similar to that quarried elsewhere in the region. These deposits are not particularly well suited for quarrying as dimension stone and have no unusual economic potential. No commercially desirable coal, oil, or gas deposits are known to exist.

5. Flora. Pioneer settlers began moving into the area in the early 1800's and the more level portions of the site were cleared of trees and planted to field crops, chiefly cotton and corn. Before TVA acquisition, the site was approximately 45 percent forested, 30 percent pasture, 20 percent cropland, and 5 percent residential. Farming practices ceased when TVA purchased the land, but agricultural use is presently being made of about 6,000 acres of the site under licensing arrangements granted by TVA.²⁰

As shown on figure 8, the forested areas vary in composition between pines, cedars, and hardwoods. South and east of Notchy Creek Knobs, most land is forested. The topography is generally quite steep, and forests are typically small sawtimber hardwoods. On the moderately moist lower slopes beech, sycamore, sweetgum, elm, red maple, ash, and hackberry occur while farther up the ridges vegetation grades into typical oak-hickory forest, with white oak being the most prominent species. There are a few stands of mixed pine, cedar, and hardwoods.

North of Notchy Creek Knobs, forests are typically mixed softwoods and hardwoods, with softwoods being more common on the drier, more southerly exposures. Forested areas consist of

pole-sized and small sawtimber-sized trees. The land is mostly underlain by limestone and eastern red cedar is quite common. In some cases following abandonment of the old fields, almost pure stands of cedar have developed. There are several scattered plantations of pole-sized yellow pine and several isolated sawtimber-sized stands of pure hardwoods. Hardwoods are typical of regional oak-hickory forests, with white oak, southern red oak, black oak, post oak, and shagbark hickory being the most common species. In poorly drained sites these forests grade into stands of yellow-poplar, red maple, ash, elm, sweetgum, and hackberry. Trees found on the Timberlake area are listed in table 5.

Changes in vegetation (succession) on old abandoned fields are typical of limestone country.²¹ Recently abandoned old fields show evidence of dominance by horseweed; later these fields are dominated by assorted asters and goldenrods. Broom sedge is most dominant in some of the oldest fields, which are being invaded by blackberries, pines, and eastern red cedar.

Unusual or rare ground flora species are not known to be present on the Timberlake site. Before TVA's acquisition of the land for the Tellico Project, the open areas were regularly disturbed by cultivation or grazing. If any unusual species were present on the Timberlake site, they could be expected to occur in the wooded areas. The tree vegetation has been typed and stand size and dominant species have been noted. No stands of outstanding interest are present on the site. The only known unusual tree is an American elm that until recently was thought to be the largest living tree of that species. It is currently believed to be the second largest elm.²³ TVA has taken measures to improve the health of the tree and protect it.

6. Ground and Surface Waters. The Timberlake area is underlain by a variety of consolidated sedimentary rocks including sandstone, siltstone, shale, limestone, and dolomite. Dolomite is the principal water-bearing rock. Bedrock is covered to varying depths by soil derived from the underlying rock, mostly clay and silt. Water occurs in interconnected pore spaces in

weathered material and in openings along fractures and bedding planes in bedrock. Ground water occurs under water-table conditions and is recharged locally from rainfall. The surface shape of the ground-water body is influenced by the overlying topography. The ground-water system is shallow, and most of the water is stored and moves at depths of less than 300 feet. Water moves relatively short distances during its subsurface residence, perhaps averaging a distance of only 2,000 to 3,000 feet before it is discharged to springs or streams. Ground-water yield potential is shown on figure 9.

Timberlake will be located in the lower reaches of the Little Tennessee River, whose watershed covers approximately 2,600 square miles of generally mountainous terrain. Tributaries with significant flow discharging into Tellico Reservoir and estimates of their daily average flows are shown on figure 10.

7. Fauna. Hunttable populations of farm game species such as rabbit, quail, and dove still exist throughout the site (table 6). Deer is the only big game animal known to reside in the project area. While bear, boar, and turkey are present at the higher elevations in adjacent forested areas, they are rarely seen on the site itself. Upland game, amphibians, reptiles, avian predators, and songbirds expected to occur in the Timberlake area are listed in tables 7, 8, and 9.

The current list of endangered species published by the U.S. Fish and Wildlife Service does not include any terrestrial vertebrate known to occur regularly in the Timberlake area. The endangered Southern Bald Eagle is sighted occasionally in the general area. Hunting and trapping of wildlife are estimated to be average as compared to the state. Average opportunities exist for nonconsumptive uses but estimates of such use are not available.

The Wood Duck is the only waterfowl species that nests regularly in the project area.²³ Nesting occurs primarily along the banks of the Tellico River and some other tributaries and some may occur in forested areas adjacent to farm ponds and small streams in the area. Additional waterfowl use of the

area is primarily limited to migratory species feeding in the bottomland fields each fall and winter.

The adjacent Tellico Reservoir will likely be used as a temporary open-water resting area for divers and puddle ducks.

Numbers may increase somewhat, but fluctuations will be high, and waterfowl hunting will be unpredictable. Winter water-level drawdowns will not be severe; therefore, wading birds and shorebirds should be found in the numbers and species typical of sightings on Fort Loudoun Reservoir.

Tellico Reservoir is expected to support a good standing crop of fish of 85 to 100 pounds per acre.²⁴ Initially, the standing crop of sport fish (black basses, sunfishes, crappies, sauger, walleye, white bass, and trout) is predicted to be 30 to 45 pounds, the shad crop about 35 pounds, and the rough fish crop 20 to 35 pounds per acre. In later years, the composition will probably include more rough fish. It is estimated that fishing trips on the lake will total about 165,000 in the first few years and increase in later years.²⁵ Fishes known to occur or which may occur within the Tellico project impoundment area are listed in table 10.

8. Climatology and Meteorology. The weather in the Timberlake area is generally mild both in winter and summer. The average monthly temperature during the winter months is in the low 40's and during the summer in the high 70's. The average monthly temperature is shown in table 11.

Precipitation over the watershed averages about 60 inches per year, making it one of the wettest in the Nation. Precipitation in the immediate vicinity of Timberlake is about 50 inches per year. The monthly rainfall averages are shown in table 11. The snowfall averages about 10 inches per year.

Air quality monitoring has been conducted by TVA since May 1971 at the Loudon trend station located 6.5 miles south-southeast of Loudon, Tennessee, which is several miles west of the Timberlake site. Data from this station are shown on table 12. Data from the U.S. Weather Bureau at the Knoxville Municipal Airport indicate that the predominate windflow follows the

general northeast-southwest valley alignment about 30 percent of the time. Other wind directions of importance are west-southwest, east-northeast, and westerly which occur about 10 percent, 16 percent and 8 percent of the time, respectively. Wind speed during the year is quite low and normally averages within the range from 4 to 12 miles per hour. The wind is calm about 10 percent of the time. These low wind speeds along with the stable atmospheric conditions are most pronounced in the fall and are often accompanied by extended periods of stagnation. Studies indicate that the possibility that two such stagnation episodes, each lasting about four days, may occur each year. Such stagnation incidents are regional in nature and are characterized by the widespread and persistent 24-hour-per-day weak wind conditions from surface to several thousand feet and extremely low-level stability conditions (inversions from surface to 500-1,000 feet) persisting from late evening through late morning on consecutive days. Such low-level inversions can be expected to occur most frequently in the fall season.

9. Historical and Cultural Features. The Timberlake area has a rich historical heritage. The National Register of Historic Places presently lists 19 places in Blount, Loudon, and Monroe Counties (figure 11). A commercial enterprise (The Lost Sea Cavern) in Monroe County is listed on the National Register of Natural Landmarks. Fort Loudoun has been a Registered National Historic Landmark since October 1966. As part of the Tellico project, TVA has identified, protected, and surveyed several archaeological sites and historical homes in the project area.²⁶ Figure 12 shows the location of those sites and structures in the immediate environs of the Timberlake site presently appearing on the National Register of Historic Places (Fort Loudoun, the sites of the former Cherokee villages of Chota and Tanassee, the Bowman House, the McGhee House and the National Campground) and other cultural features.

B. Existing and Planned Area Infrastructure

The existing and planned infrastructure related to the Timberlake site is shown on Figure 13 and discussed below.

1. Tellico Dam and Reservoir. The Tellico Dam is under construction on the Little Tennessee River about one-quarter mile above its confluence with the Tennessee River. The dam, scheduled for completion in January 1977, will create a 16,500-acre reservoir with about 300 miles of shoreline. The normal maximum pool of the reservoir will be at elevation 813 feet above mean sea level with a normal fluctuation of six feet. A reservoir operation guide is shown on figure 14. A commercially navigable canal will connect the Tellico Reservoir with Fort Loudoun Reservoir on the Tennessee River and the Interconnected Inland Waterway System.

2. Transportation. Approximately 77 miles of new roads and 13 new bridges are being built as part of the Tellico Project. Completion of these roads and bridges will greatly improve the local road circulation network and provide regional highway accessibility to and within the area. The Tellico Parkway is being designed by TVA to facilitate future expansion to a four-lane, limited-access highway. The parkway will be within the present land purchase boundary of the Tellico Project. TVA also plans to purchase the right of way necessary for four lanes for that portion of State Route 72 relocated north of U.S. Highway 411. The highway will have limited access for about 9.5 miles north of U.S. 411. Both roads will be constructed initially as two-lane roads.

In addition to the improvements being made as part of the Tellico Project, other roads in the area that have been identified for possible future improvement by other agencies or organizations are:

1. Expansion of U.S. Highway 411 to a four-lane major arterial.
2. Construction of U.S. Highway 441 bypass of Vonore, Tennessee.

3. Construction of State Route 72 bypass of Loudon, Tennessee.
4. Construction of a bridge across the Little Tennessee River below Chilhowee Dam.²⁷
5. Completion of an access road to State Route 95 on the northeast (right) bank of the reservoir.²⁸
6. Construction of State Route 95 from near the Loudon-Blount County line to just west of U.S. 129.²⁹

The 1972 traffic loads for major roads in the vicinity are shown in figure 15. The Tennessee Department of Highways 1990 Highway Plan showing the proposed road classification for the area is shown on figure 16.

A main line of the Louisville and Nashville Railroad crosses the site at about river mile 18.7, and an average of 18 trains pass daily. The approach trackage to the present bridge on the southwest (left) bank will remain in place after the bridge is relocated to serve the proposed public port facility. The underwater portion of the port facility will be prepared during clearing of the reservoir area. A 9-foot navigable channel will connect the port facility with over 10,000 miles of the Interconnected Inland Waterway System that serves ports in 21 states (figure 17).

3. Water Treatment Plant. A joint water system is being constructed by Loudon and Monroe Counties through the Tellico Area Services System (TASS).³⁰ Appropriate land treatment and building design will be required of the water system to avoid any undue visual impact on the total setting. The water treatment plant will be located on the northeast (right) bank just upstream from U.S. Highway 411 near river mile 19. Initial capacity of the water treatment facility will be 3.5 million gallons per day (MGD)³¹ (figure 13).

4. Sanitary Landfills. In the area there are two sanitary landfill sites approved by the Tennessee Department of Public Health. Monroe County has an 80-acre site near Hopewell Springs, approximately five miles southeast of Madisonville on the Ballplay Road. The site will be registered and become

operational when design plans are completed and approved. A second site, the Red Ridge Landfill Company, is located three miles west of the Timberlake site. The site contains approximately 1,000 acres, 40 acres of which are presently registered for operation. This site presently serves Loudon County; the communities of Vonore, Madisonville, and Sweetwater in Monroe County; and Newport in Cocke County.

5. Power Transmission Lines. Four TVA power transmission lines cross the Timberlake site: Watts Bar-Fort Loudoun No. 2, a 161-kilovolt line in the vicinity of Tellico Dam; Watts Bar-Fort Loudoun No. 1, a 161-kilovolt line at river mile 5.8; Fort Loudoun-Jena-Athens, a 69-kilovolt line at river mile 18.7; and Hiwassee-Alcoa, a 161-kilovolt line at river mile 29.6.

6. Pipeline Crossings. The East Tennessee Natural Gas Company has two underground gas pipelines crossing portions of the new community site. A 12-inch line running from Chattanooga to Knoxville crosses the site about two miles north of Vonore. A lateral 6-inch line to Loudon and Lenoir City branches off the main line on the left bank about one mile north of Vonore. A second lateral line on the right bank serves the nearby community of Greenback.

II. SOCIOECONOMIC SETTING

A. Population

The three-county area had a population of 111,485 in 1970. The population of Blount County was 63,744; of Loudon County, 24,266; and of Monroe County, 23,475. The population growth from 1960 to 1970 varied greatly among counties and reflected the different economic conditions in them. The population of Blount County, which is part of the Knoxville SMSA, increased almost 11 percent, while Loudon and Monroe Counties increased 2.1 percent and 0.7 percent, respectively. During the same period, the population of the State of Tennessee grew by about 10 percent. The population of the three counties is generally older than that of the State of Tennessee.

Current projections for the three-county area indicate that population will increase by about 29,000 people and employment

by about 12,000 jobs during the period 1975 through 1995 (table 13). These projections do not take into consideration the impact of the development of Timberlake.

B. Economic Conditions

1. Employment. The economy of the three-county area is characteristic of rural Appalachia, as is that of much of east Tennessee. Industrial development has been generally slow, hampered by terrain that limits the availability of industrial sites and makes construction of transportation networks very expensive. The relative underdevelopment of this area has resulted in insufficient numbers of jobs for those persons seeking adequate employment opportunities. Historically, jobs available have been generally low-wage jobs that require limited skill and afford little chance for advancement. Evidence of this lack of opportunity is provided by an examination of net migration characteristics for the three counties in recent decades. The area experienced a net outmigration of about 15,500 persons from 1950 to 1960 and 3,600 persons from 1960 to 1970. Although net outmigration between 1960 and 1970 was significantly smaller than between 1950 and 1960, substantial numbers of younger, more productive people are still leaving the area.

The age distribution of the outmigration is significant. There was a net loss through migration of over 14,500 persons in the 15 to 29 age group between 1950 and 1970, representing 76 percent of the total net outmigration (table 14). Even Blount County, which experienced a small net immigration, experienced net outmigration in the younger adult age groups. Continuation of this trend will be detrimental in terms of sustaining the future economic viability of the area.

Manufacturing employment dominates total employment of the area. Manufacturing accounts for 46 percent of the employment of Loudon County residents, 43 percent of Monroe County, and 36 percent of Blount County (table 15). Many of the people presently residing in the three-county area are employed in surrounding counties. In 1970, 9,200 persons commuted out of

the three-county area to work. Of these persons, 6,800 commuted to Knox and Anderson Counties, and over 1,000 Monroe County residents commuted to McMinn County. In the same year, only 2,682 persons were commuting into the three-county area from outside the area; 1,800 of these were commuting to Blount County. The number of employed residents of the three-county area, regardless of place of work, has not increased rapidly, although the growth for Blount County has been substantially faster than the State of Tennessee or the 201-county Tennessee Valley region (table 16).

In recent years, the unemployment rates in Loudon and Monroe Counties have been generally higher than the State of Tennessee and the Nation (table 17). In June 1975 their unemployment rates were estimated to be 9.9 percent and 13.7 percent, respectively. Unemployment in Blount County for June was estimated to be 7.8 percent, which was lower than the State of Tennessee and the Nation.

Opportunities for upward mobility of workers developing new skills are limited, and many of the jobs available in the area offer few opportunities for advancement or promotion. Knoxville is the nearest metropolitan area which does offer opportunity, but it is not considered a fast-growing area³² and cannot satisfy or absorb many people from the surrounding areas seeking better employment opportunities. The obvious choices for these persons are to move away from the area or to forego reasonable opportunities for job selection.

2. Income. In Monroe County, the average annual wage earned by manufacturing workers in 1973 was \$4,675; in Loudon County, it was \$6,122. The average in Blount County was higher and compared favorably with the 1973 average of \$7,581 for the State of Tennessee due largely to the presence of ALCOA.³³ Although data on wages in nonmanufacturing sectors are scarce, those that are available suggest that wages are low in these counties, especially Loudon and Monroe. Average wages in 1973 in all jobs covered by employment insurance laws was \$4,916 in Monroe County, \$5,723 in Loudon County, and \$8,588 in

Blount County.³⁴ This compares with \$7,329 for the State of Tennessee.

In terms of per capita personal income, the three counties range from about 56 to 76 percent of the national average (table 18).

Tables 19 and 20 illustrate the percentage change in selected personal income and earning components for Loudon and Monroe Counties.³⁵ From 1959 to 1969 total personal income in Loudon and Monroe Counties increased at a slower rate on a percentage basis than the region and the nation; however, personal income in Monroe County increased faster than counties in the region with towns of similar size. In several categories, earnings increased at a higher rate in the two counties than the region, but the per capita personal income figures indicate that these counties are still economically underdeveloped compared to the rest of the state and nation.

3. Retail Trade, Selected Services, and Wholesale Trade.

According to the latest available published information,³⁶ the rate of growth of retail sales from 1963 to 1972 was lower for each of the three counties than for the Knoxville trade area, (tables 21 through 24). Sales per establishment increased in all counties between 1963 and 1972 but were substantially lower than those in the Knoxville trade area in 1972. Total sales in wholesale trade increased faster in each of the three counties than in the Knoxville trade area; however, sales per establishment were lower. Total receipts in selected services increased faster in Loudon and Monroe Counties from 1963 to 1967 than in the Knoxville trade area. Sales per services establishment were lower in all three counties than in the trade area.

C. Services and Facilities

Governmental services available in the area are those commonly provided by county government. These include rural road maintenance, law enforcement, education, and limited public health service.

The Timberlake site is not served by a water system, wastewater sewerage and treatment system, or public solid waste collection and disposal system. A joint water system is under construction by Loudon and Monroe Counties. Loudon County is also planning a solid waste collection and disposal system. Rural electrical service is provided by the Fort Loudoun Electric Cooperative and the Loudon Utilities system. Their service areas are shown on figure 18. A natural gas line crosses the site about two miles north of Vonore. No new service connections are being made at this time because of limited gas supplies. There is no public transportation in the area.

According to Tennessee Department of Public Health Standards and recent studies by the East Tennessee Development District,³⁷ the area has an adequate supply of acute-care hospital beds. There is a shortage of general physicians' clinics and other primary medical care facilities.

A 1970 study by the University of Tennessee reports that educational opportunities in the three-county area vary considerably from one community to another. Existing practices for allocating resources, both human and financial, in the seven local school districts have resulted in wide variation in the amount of funding per pupil. There are wide disparities in school rankings on student success, teacher education, and other indices of educational quality. It is estimated that the expected lifetime earnings of those students who dropped out during the 1968-69 school year could be reduced by almost 15 million dollars as a result of their leaving school.

Several deficiencies are common to all local school districts of the area. All seven districts are below the national average of 52 percent local financial support for education. Curriculum offerings are essentially in general education with limited programs in occupational preparation and cultural enrichment. Services for handicapped and preschool children and adults are limited.

These common problems are particularly evident in the immediate area of Timberlake, where a high percentage of the students are enrolled in small schools housing grades 1 through 8 and 1 through 12. Four small schools have a combined enrollment in grades 9 through 12 less than the minimum number recommended by the State of Tennessee. Elementary schools serving the greater Timberlake area have fewer than one teacher per grade.³⁸

D. Housing

The age of the average house in the Timberlake area is older than that in the State of Tennessee. According to the 1970 census, 44 percent of the housing stock in Loudon County was built in 1939 or earlier. In Blount and Monroe Counties, the percentage of housing units built in 1939 or earlier was 32 and 38, respectively. In comparison 31 percent of the housing in the State of Tennessee was in that same age group. Monroe County falls below both the Tennessee Valley region and the State of Tennessee in percentage of all year-round housing units that are owner occupied and have complete plumbing facilities (table 25). Comparative crowding ratios show that owner-occupied housing in Loudon and Monroe Counties is significantly more crowded than the state or national averages. As is typical in nonurbanized areas, there are more homeowners than renters. Almost 70 percent of the dwellings were owner occupied, compared with 63 percent in both the region and the nation and 62 percent in Tennessee.

The housing market, for both rental and for sale units, is tight. Only 1.9 percent of all year-round rental housing units are vacant, and of these, 46 percent have been vacant less than two months, compared with 50 percent in the region and 56 percent in Tennessee. In the homeowner housing market, 0.62 percent of all year-round housing units in the three-county area are vacant and for sale, compared with 0.74 percent in the region and 0.78 percent in Tennessee.

As shown in table 25, the average value of owner-occupied housing in Blount County is \$14,731 compared with \$14,298 in

the region and \$14,834 in Tennessee; housing in Loudon and Monroe Counties has a significantly lower average value (about \$11,000), which is probably due to the fact that these counties are less urbanized. The table also shows the average monthly rent in the three-county area falls somewhat below that of the state and the region. The average rent in Blount County is higher than in the other two counties, indicating a greater demand for rental units in Blount County.

III. RELATIONSHIP TO REGIONAL GOALS AND OBJECTIVES

Several organizations and agencies have an interest in the Timberlake area. Some of these entities have planning programs that would affect, or be affected by the proposed new community. Several have identified specific goals and objectives which Timberlake will help to achieve.

A. Tellico Area Planning Council

In 1968, the Tellico Area Planning Council adopted a recommendation asking TVA to pursue a general development plan for the shorelands surrounding the entire Tellico Reservoir. The proposed plan, shown on figure 19, and other recommendations³⁹ were aimed at economic development of the region.

B. Blount, Loudon, and Monroe Counties

The planning commissions of the three counties, with the assistance of the East Tennessee Development District, have prepared and adopted a comprehensive plan for guiding orderly development. A summary of regional goals identified in the plan is as follows:⁴⁰

1. Locate more industry by acquisition and development of industrial sites.
2. Optimize development of recreation and tourism potential. Make greater use of TVA lakes and shoreline recreation areas through promotion of public and commercial facilities and resorts. Expand neighborhood recreational programs and facilities and regional centers to reduce the necessity for leaving the area for these needs.

3. Improve quality of sanitation and housing, including subdivision design and expanded water and wastewater systems.
4. Improve knowledge about job opportunities. Expand basic educational and vocational training program. Encourage programs to lessen the high school dropout rate.
5. Develop uncongested and efficient transportation routes.
6. Encourage settlement patterns that could be serviced in a more efficient and economical manner. Encourage land use patterns that consider the natural conditions and potential of the land.
7. Maintain the natural beauty of the area by encouraging attractive architecture and removing trash and other unsightly features.
8. Encourage a full appreciation of historical heritage by marking historical features and restoring historical structures.

C. East Tennessee Development District

The East Tennessee Development District (ETDD) is the multi-county regional planning agency for the 16-county region in which Blount, Loudon, and Monroe Counties are located and is the state-designated regional review (A-95) agency. The Board of ETDD is composed of locally elected and appointed officials.

No comprehensive district-wide plans have been completed for land use, recreation development, water and waste treatment facilities, and industrial development, but work on all is underway. In the interim, ETDD has adopted the comprehensive plan of the three counties. The following regional goals and objectives have been adopted.⁴¹

1. Promote systematic and appropriate development and use of the district's land,
2. Promote a more efficient use of natural resources,
3. Develop and improve external and internal roads and highways to improve circulation and promote development,
4. Facilitate the better use of existing and future water and wastewater systems,

5. Improve recreational facilities for both external and local use and promote tourism,
6. Improve the quality of housing and the residential environment, and
7. Provide greater job opportunities and better facilities for industrial location and increased commercial development.

An important aspect of Timberlake planning has been to ensure that facilities of the new community will be complementary to both the ETDD goals and the three counties' goals. Timberlake will aid in the achievement of these goals in several ways. The addition of industrial jobs and provision of facilities and services to attract industry are important aspects of Timberlake. The public and private recreational facilities planned for Timberlake will increase the general attractiveness of the east Tennessee area for tourism. Timberlake will also serve to provide more and better quality housing within the district, including low-income and moderate-income housing. Provision of public services for Timberlake is being coordinated with comprehensive plans for these services jointly prepared by the planning commission of the three counties, with technical assistance from ETDD. Two multicounty organizations have been formed with the assistance of ETDD, the Tennessee State Planning Office and TVA. The Tellico Area Services System (TASS) will provide water and possibly other services⁴² to residents of Loudon and Monroe Counties, and the Little Tennessee Valley Educational Cooperative is planning for educational facilities and programs in the three counties. The health care concepts are being coordinated with the 16-county Comprehensive Health Planning Council and Regional Medical Program as well as with county health agencies and ETDD. Other services such as wastewater treatment are still in the conceptual planning stage and will be coordinated with area interests.

The ETDD has adopted a development strategy for the 16-county region that encourages growth and development in selected areas based upon their stage of economic growth and growth

potential. The strategy considers the priorities to be used in allocating developmental assistance and support among existing communities but does not deal with the potential of new community development within the district. Timberlake is adjacent to one of these areas, Loudon-Lenoir City and near the Sweetwater-Madisonville area, and is expected to complement the development strategy.

D. State of Tennessee

The State of Tennessee has no formal comprehensive statewide development plan,⁴³ yet many program interests are conducted on a statewide basis. To ensure consistency with state programs and interests, coordination with the state has been maintained through the Office of Urban and Federal Affairs and the Tennessee State Planning Office. In planning for specific aspects of Timberlake, however, TVA has worked directly with other departments such as the Departments of Transportation; Public Health; and Conservation.

E. Other Federal Agencies

Early in the planning for the Tellico Project, discussions were begun with the National Park Service and the U.S. Forest Service to determine how shoreland use could best relate and contribute to their national and regional program goals. The significance of the project in terms of potentials for area development and the interrelationships between the Tellico Reservoir, the Great Smoky Mountains National Park, the Foot-hills Parkway, and Cherokee National Forest was further assessed through joint field inspection of the upper Tellico Reservoir area by TVA, National Park Service, and U.S. Forest Service.

Almost 8 million visits were recorded in the Great Smoky Mountains National Park in 1974, and estimated visitation could reach over 14 million by 1990.⁴⁴ Increasing environmental awareness has prompted concern in the National Park Service for perfecting long-term resource protection measures and establishing access and visitation patterns that minimize

intrusion and congestion, which endanger both the resource and the quality of the visitor experience.⁴⁵ In the light of this concern, the National Park Service is in the process of developing a new comprehensive master plan to guide development and management of the park from 1975 through 1990. The plan will identify future purposes of the park and its relationship to recreation resources opportunities in surrounding 13-county interstate region.

In developing the master plan, the National Park Service utilized an interagency task force composed of representatives of local planning and development districts in Tennessee and North Carolina, TVA, and representatives of other Federal, state and local agencies, private citizens, and persons from organized conservation groups. The preliminary recommendations of the preliminary recommendation of this task force support the recreational concept for Timberlake as an important element in a coordinated regional approach to providing recreational opportunities near the park's periphery to complement the National Park Service's efforts to reduce public demand for high-density recreation areas within the park.⁴⁶

The U.S. Forest Service is responsible for the land management program within the Cherokee National Forest, which will be adjacent to Timberlake. Because of this relationship, TVA has endeavored to inform the Forest Service fully of its planning for Timberlake. The discussions have led to the mutual understanding that development occurring on the lands adjacent to the forest should be of high quality and well managed. The Timberlake concept will ensure that this desire is realized in the Tellico Reservoir area.

IV. LOCAL GOVERNMENT AGENCIES WITH RELATED PLANNING AND ZONING RESPONSIBILITIES

A number of local authorities have planning and review responsibilities for the area in which the new community is located or immediately adjacent to it:

Lenoir City Regional Planning Commission
Loudon Regional Planning Commission
Madisonville Regional Planning Commission
Vonore Planning Commission
Loudon County Regional Planning Commission
Monroe County Regional Planning Commission
Blount County Regional Planning Commission

Actions by these commissions could affect the proposed new community. As shown in figure 20, the planning region boundary of Lenoir City overlays an area of about 400 acres in the northern part of the site. The commission has adopted subdivision regulations. Loudon and Monroe Counties have authority to administer similar controls over the remaining Timberlake site. Loudon County has adopted subdivision regulations and a zoning ordinance. The site within this jurisdiction is zoned Agriculture - Forestry (A-1) and Rural Residential (A-2). Monroe County has not adopted subdivision regulations or a zoning ordinance.

Madisonville has adopted subdivision and zoning regulations; however, the zoning regulation is limited to the area within the city's corporate limits. Vonore has a municipal planning commission whose jurisdiction falls within the corporate limits. The commission has adopted subdivision regulations. Blount County has adopted subdivision regulations and has been considering adoption of a zoning resolution.

ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

I. IMPACT ON NATURAL ENVIRONMENT

A. Land Use

1. General Land Use. Approximately 16,000 acres of land are available for the development of Timberlake. The percentage of land that would ultimately be devoted to various community facilities and functions will be determined as the definitive land use plan is developed over the development period. For initial land use estimates, however, the general land use plan shown in figure 4 has been used.

Residential, recreational, and industrial activities comprise about 36, 23, and 17 percent, respectively of the site.

The general land use budget in acres allocated for these and other functions within Timberlake is shown in table 26. TVA will have full custody of the site⁴⁷ which will enable it to control reservoir access and guide the proper development of land resources according to adopted plans. Federal ownership of the prime industrial, recreation, and residential areas will ensure that they will be developed in compliance with all applicable laws and regulations and in accordance with high standards of environmental protection, design, and planning established for Timberlake. TVA will place appropriate covenants and restrictions in deeds or other instruments for conveyance of land or land rights to control potentially detrimental effects.

TVA flood control operations on the Upper Little Tennessee River will prevent any significant impact from flooding within Timberlake; however, some local flooding on tributaries to the Little Tennessee River and the Tellico River could occur. Wherever a significant flood hazard is involved, deed restrictions will be used to assure that land sold by TVA is used in a manner that will be compatible with such hazard. TVA will also provide information and technical assistance to the local government that will enable it to include regulations for prevention of flood damage in its land use controls wherever appropriate.

2. External Secondary Effects. As building activities associated with Timberlake increase, development pressures will also increase on neighboring unincorporated lands and in Vonore, Tennessee. Much of the unincorporated land is now primarily agricultural or undeveloped nonfarm, with scattered single family homes along rural roads. Loudon and Blount Counties and Vonore have adopted subdivision regulations, and Loudon County has a zoning ordinance. Monroe County has adopted neither. TVA, as part of the Tellico project, entered into a contract to assist the Tennessee State Planning Office in establishing active county-wide planning programs in Loudon and Monroe Counties.⁴⁸ The intent of this program was to encourage cooperative planning and development efforts between the two counties, the municipalities within their boundaries, and the new community. TVA will initially have custody and control of the Timberlake land base, and public control should allow the public and private sectors to realize location economies through reasonably priced land, which is not subject to speculative cost escalation. It is hoped that this will discourage unbridled land price speculation near Timberlake since it can be presumed that developers will seek these location economies and want the protection of Timberlake standards. Developers choosing to avoid these standards by locating outside Timberlake may pay inflated land prices and choose to "economize" on their facilities, creating long-term problems of adverse quality and appearance.

Because local governments are responsible for controlling land use, local desire and willingness to participate in implementing and enforcing land use regulations, standards, and ordinances will determine the appearance and use of lands surrounding Timberlake. In an effort to help create a desirable impact on the surrounding rural area, TVA will invite the planning commission chairman and local farm leaders to participate on the Timberlake Advisory Board.

B. Flora

Approximately 6,000 acres of the site are now being used for purposes related to agriculture through short-term licensing agreements. As Timberlake develops, the number of acres farmed on this basis will gradually decrease. Fields not licensed will become revegetated with a variety of plants and will move through an expected pattern of succession typical of limestone areas: horseweed, asters, goldenrod, broom sedge, and later blackberries, pines, and eastern red cedar. It is inevitable that some vegetation will be removed during the development of the new community. The effect on the woodlands will vary with different types of development, the character of the woodlands, and their location. To lessen detrimental effects on existing woodlands, TVA will:

1. Give careful consideration to the location of different land uses in relation to the existing woodlands.
2. Protect desirable stands and individual trees where feasible. This will be done before detailed design and construction by conducting on-site inspections and evaluations of desirable trees and tree stands and establishing criteria regarding tree removal and protection during construction.
3. Require appropriate landscaping and planting of desirable trees and other vegetation.

It is estimated that there are approximately 10,000 acres of forested area containing a merchantable sawtimber volume of 27.0 million board feet on the shorelands. At least two-thirds of this acreage and volume will be directly affected by the construction of Timberlake. Except for the trees harvested during construction, production from these woodlands will be permanently lost to the timber market.

This loss is about 1.3 percent of the potential timber resource of Blount, Loudon, and Monroe Counties. The effort on timber-based industry will not be significant. Commercial forests in the three-county tributary area total 500,800 acres.⁴⁹ Preservation and management of these woods within Timberlake,

however, will provide erosion control, open space, wildlife habitat, visual and noise screens, sites for environmental study, recreation, and aesthetic values. The remaining one-third of the forested area and volume will not be directly affected and can be managed for wood production as well as the benefits listed above. As stated earlier, unusual ground flora species are not known to be present on the Timberlake site, but if any do occur, they are expected to be in the wooded areas. Since considerable woodlands will be maintained in the Timberlake boundaries, the chances for continued survival of any unusual plant species should be increased. The only unusual tree known on the area is the second largest American elm, and it is under no threat from Timberlake.

C. Fauna

The development of Timberlake is not expected to have any significant impact on the fishery of Tellico Reservoir. Increased turbidity and sediment during construction and chemicals used on yards and plantings may have some minor effect. Low-level additions of enriching substances could be beneficial to the fish production capabilities of the reservoir. Effluents from domestic, commercial, and industrial sources will be controlled and discharged in accordance with applicable water quality standards and should have no adverse effect on fish. Fuel spills or waste discharge from power boats that might affect fish are not expected to be significant. Based on experience at other TVA reservoirs, the projected fishing use on Tellico Reservoir due to Timberlake development should not have adverse effects on the fishery resource. Project plans will include provisions to retain where feasible shoreline and other habitat which will have a favorable effect on the fishery.

Waterfowl use of the project area is light, and Timberlake is expected to have only a minor impact on that use. Development may gradually reduce shoreline field feeding opportunities by 50 percent, but this will be offset somewhat by the restrictions on hunting within the community area.

Observations in this portion of the Tennessee Valley region indicate that the size of waterfowl populations on lakes that are not refuges or public hunting areas depends on the availability of cornfields as a source of food.⁵¹ As shown in table 27, the shift from row-crop farming (primarily corn) to cattle grazing has been taking place within the 3-county area for many years. With this shift in land use has come a reduction in the attractiveness of the area for waterfowl. The development of Timberlake will have very little impact on further reduction of acreage devoted to row-crop farming. Less than 3 percent of the corn production in the 3-county area was growing on the site before the land was purchased for the Tellico Project. The only waterfowl species that nests regularly in the project area is the Wood Duck, and little change is expected in its numbers because Timberlake development will be primarily in the upland area, which is little used by this species. Wading birds and shorebirds should be abundant.

As development occurs, upland game and deer residing in the area of the new community will decrease, and as the human population increases, pressures on wildlife populations in the project area will increase. To offset this impact, TVA will manage portions of the 2,700 acres of prospective shoreline habitat to benefit songbirds, quail, rabbits, and other small game. In addition, habitats will be maintained and enhanced for upland wildlife and songbirds throughout Timberlake. Open space, path systems, and natural areas through the new community, and power line rights of way through the area will be planned to help keep the area suitable for various species. Parts of the project area will be protected and maintained as habitat suitable for wildlife such as deer, fox, raccoon, and turkey; however, the degree to which these species will be present and seen within Timberlake will depend largely upon the actions of the people who live and visit there. It is hoped that, through increasing community pride and environmental awareness of both residents

and people from surrounding areas, it will eventually be possible for even these larger species to be present and visible in the less developed sections of Timberlake. As development proceeds, hunting will have to be progressively restricted within developed areas of Timberlake. Songbirds and small animals such as squirrels and chipmunks may become more abundant than they are at present. The Southern Bald Eagle is only occasionally sighted in the area as a winter transient and should not be adversely impacted by the project.

D. Air Quality

Both the construction activities associated with Timberlake and the new community itself will affect air quality. The primary adverse impact will occur during periods of stagnation when air pollutants tend to accumulate and ground level concentrations become progressively higher, particularly during the stable nighttime periods. Activities associated with Timberlake should pose minimal air quality problems even during these infrequent stagnation episodes for the reasons discussed in this section. In TVA's judgment, Timberlake can be developed consistently with all Federal and state air quality requirements.

1. Short-term Effects. The major pollutant resulting from construction activities will be airborne dust and fumes created by drilling, blasting, materials handling, operation of heavy equipment, and wind erosion. Short-term impacts will be ameliorated through efforts to prevent the emissions at the source. Wet sprays and sprinkling will be used for construction activities and on unpaved roads. Periodic inspections will be conducted to ensure proper maintenance of construction equipment to minimize exhaust emissions. Open burning of trees, brush, and construction waste will be minimized and controlled, and all alternatives to open burning, such as selling timber, chipping, or burning in an air curtain incinerator will be evaluated and used where practical. In

addition, all applicable air quality performance standards governing construction activities will be followed.

2. Long-term Effects. The long-term impact of Timberlake on air quality will primarily result from industrial development and increases in motor vehicle traffic. These activities will affect air quality by creating a variety of potential pollutants, including industrial fumes and exhaust emissions. Residential, commercial, and recreational development is not expected to be a source of significant air pollution. The industries locating in or near Timberlake will be subject to the air pollution control regulatory scheme established under Federal and state law. Each industry will be required to obtain a permit from Tennessee air pollution control officials prior to construction. The permit will require the installation of air pollution control equipment and would not be issued if the industry were located too close to other sources of air pollution. In addition, TVA will consider the potential impacts of industrial development on air quality when making specific tracts available for development. TVA believes adherence to this regulatory scheme will effectively minimize adverse impacts on air quality resulting from industrial development. General air quality characteristics of industrial groups with potential for locating at Timberlake are shown on table 28.

Under the existing air pollution control regulatory scheme, standards have been established that set maximum concentrations for potentially harmful substances in the air. The standards are calculated to ensure the protection of public health with an adequate margin of safety and the protection of public welfare concerns, such as, water, vegetation, animals, property, visibility, climate, and human comfort and well being. In the case of new plants, Federal law imposes the additional requirement that the Environmental Protection Agency establish emission standards requiring new plants to employ, in general, the best available air pollution control technology. EPA has already established such standards

for many types of industrial plants and is continuing to develop and promulgate standards for others. By the time industrial development in Timberlake actually begins, Federal standards for new plants should cover most significant industrial activity. In addition, the State of Tennessee has established stringent emission standards for specific air pollutants that would be applicable to all plants that emit those pollutants.

The number of motorized vehicles operating in the area will increase substantially as a result of Timberlake. TVA will utilize air quality models to evaluate alternative internal transportation plans. The final internal transportation plan will be designed to minimize potential traffic congestion points and to reduce through traffic in the more heavily populated areas. Landscaping techniques will be employed where practical along arterial highways to reduce air pollution levels of adjoining inhabited areas. The operation of a public transportation system within selected portions of the new town and the use of financial incentives, such as tax credits and toll parking charges, to encourage less reliance on private automobiles will be investigated. The plan will include a network of pedestrian paths and nonmotorized bike-ways which will connect the major activity centers with the residential areas. In addition, TVA will include in the open space system provision for a future right of way that can be adapted to an internal public transportation system at such time as density, community size, public policy, or other conditions warrant such a system.

The control of air pollution from increased traffic will be facilitated by Federal law requirements that motor vehicles be designed to reduce carbon monoxide and hydrocarbon exhaust emissions. By the time significant growth occurs in Timberlake, a substantial percentage of vehicles should be fitted with emission control devices. As growth increases, so will the percentage of vehicles using such devices, since most of the older, less-controlled vehicles will be retired.

Furthermore, the Environmental Protection Agency has issued regulations requiring developers to submit for review plans that involve the construction of certain facilities, such as parking lots, roads, apartment buildings, and industrial and recreational facilities, which tend to increase vehicular traffic and resulting emissions. No development plans can be approved if they will result in any adverse impact to public health or public welfare.

The residential, commercial, and recreational development associated with Timberlake is not expected to contribute any significant air quality problems. In all probability, electricity will be used for space heating and cooling, and no significant problems of air pollution would be anticipated. TVA will participate in research to identify better ways to design, construct, and orient buildings to minimize the energy needed for the purposes of heating and cooling.

E. Water Quality

The waters of the Tellico Reservoir are expected to be of high quality, and TVA is committed to developing Timberlake in a manner consistent with maintenance of this quality.⁵¹ The principal sources of possible water pollution are storm water runoff, wastewater treatment plants, and industries. Commercial and recreational watercraft may have some minor impact on water quality.

1. Storm Water Runoff. During construction, settling ponds, check dams, drainage ditches, and other standard controls deemed feasible will be used to collect storm water runoff where necessary to prevent erosion and reduce the amounts of sediment reaching local streams and the reservoir. Construction planning and operation will be guided by information concerning methods available to control pollution from construction activities developed by the Environmental Protection Agency pursuant to the Federal Water Pollution Control Act. Applicable requirements designed to prevent pollution from construction activities will be met. With these precautions, construction activities at Timberlake are not expected to have a significant impact on water quality.

The long-term effect on the bacterial quality of the reservoir of stormwater runoff from streets and other surfaces in Timberlake is not expected to be significantly different than would be expected from drainage from agricultural and forested areas. The normal runoff from farm fields and pasturelands produces moderate amounts of sulphates, phosphates, nitrates, and residues from animal manure. Studies made by TVA during the period of 1965 to 1970 showed that stormwater runoff from agricultural and forested areas (some of which were located in the Timberlake area) and suburban areas contain about the same concentrations of fecal coliform bacteria, which were primarily of animal origin.⁵² It is expected that stormwater runoff will be regulated either by the permit requirements of the Federal Water Pollution Control Act or by new Federal or state legislation dealing specifically with nonpoint source discharges.

2. Wastewater Treatment. It is estimated that by the end of the twentieth development year there will be a requirement for treatment of about 11 million gallons per day (MGD) of wastewater from residential, recreational, commercial, and industrial sources. Analysis of alternative treatment methods indicate that this amount of wastewater can be handled without a significant adverse impact on water quality.

It is presently planned to treat wastewater during the early years of development in package treatment plants located in the developing areas and to discharge plant effluents through deep-water diffuser outfalls in Tellico Reservoir. These plants will provide secondary treatment plus chlorination and will be characterized by about 90 percent removal of biochemical oxygen demand (BOD) and suspended solids.

A specific proposal for a permanent method of treating wastewater has not been made at this time. Technical advances in waste treatment may take place before construction of a permanent treatment plant at Timberlake in the early 1980's. However, the long-term objective for Timberlake is an advanced waste treatment facility that will provide an overall removal

of at least 98 percent of the organic load discharged into the system.

The section, "Wastewater Treatment System" on page 34, identifies three alternative wastewater treatment systems being considered for Timberlake. The effect of Timberlake wastewater discharges on water quality in the Tellico Reservoir has been estimated for treatment plant locations described in concepts (1) and (2) of that section. Assuming only the treated effluent from the treatment plant located south of Bat Creek Knobs as described in concept (1) is discharged into the reservoir, it is estimated that Timberlake will increase concentrations of nitrogen in the reservoir by less than 3 percent and total phosphorus concentrations by about 12 percent. Similarly, if all treated wastewater from Timberlake were to be discharged to Tellico Reservoir as described in concept (2), it is estimated that mean concentrations of nitrogen will increase by about 7 percent and total phosphorus concentrations by about 32 percent. Including Timberlake, the mean concentration of the total nitrogen and phosphorus in the reservoir is expected to be about 0.39 mg/l and 0.034 mg/l, respectively, assuming concept (1); and 0.41 mg/l and 0.04 mg/l, respectively, assuming concept (2). Preliminary studies indicate that if the effluent from the treatment plant were discharged in such a biochemical condition that it would instantaneously exert its ultimate oxygen demand on the reservoir, that demand would amount to an estimated oxygen depletion of less than 0.04 mg/l and 0.25 mg/l, respectively, for concepts (1) and (2) in the minimum continuous flow of 1,350 cfs that is maintained from Chilhowee Dam upstream. While the impact of concept (2) is greater than concept (1), TVA does not consider these nutrient levels to be so high as to preclude this alternative concept from future consideration and believes the effect of Timberlake on eutrophication of the Tellico Reservoir assuming either concept will be minimal.

3. Industrial Development. Industrial wastes are not expected to have a significant effect on water quality. In addition to the restrictions included in the land transfer documents, all industries locating in Timberlake will be subject to the regulatory scheme established by the Federal Water Pollution Control Act. The requirements that will be applicable in any given case will depend on the particular industry involved, the date construction of the plant is commenced, and whether new source performance standards have been proposed for that industry. However, the Federal Water Pollution Control Act established a general goal of no discharge of pollutants by 1985 and a minimum requirement of compliance with all state water quality standards. In TVA's judgment, adherence to this regulatory scheme will allow the development of industry in Timberlake with only a minimal impact on water quality.

The Federal Water Pollution Control Act standards will be enforced by a permit required of each industry. At the present time, the Environmental Protection Agency issues these permits to dischargers located in Tennessee. In addition, the Tennessee Water Quality Control Board issues permits required by state law. It is possible that in the future the two permit programs would be combined, and a non-Federal discharger would be required to obtain a permit only from the state. Federal dischargers would continue to obtain permits from the Environmental Protection Agency. Those industries that discharge into the Timberlake wastewater treatment system rather than directly into the reservoir will be required by the Federal Water Pollution Control Act to pretreat their effluent to eliminate any pollutant that cannot be treated adequately by the central treatment system. General characteristics of wastewater from industrial groups with potential for locating in Timberlake are shown in table 29.

4. Watercraft. Commercial barge operations represent a possible source of water pollution. Pollution from these

operations usually results from spills during transfer of cargo to or from barges. To minimize any adverse impacts that may occur, all applicable pollution regulations of the U.S. Coast Guard will be incorporated into the design and management of facilities for transferring cargo. The possibility of a barge sinking is recognized; but the probability of occurrence is quite small. During the 17 months between September 11, 1972, and February 28, 1974, more than 38,000 barges entered the Tennessee River System. Only 23 barges sank during this period, and none of them was carrying materials capable of causing serious pollution.⁵³

The increasing use of the reservoir by powerboats may cause minor amounts of pollution from fuel and sanitary discharges. Sanitary discharges from watercraft will be regulated by the Federal Water Pollution Control Act which requires that the Secretary of Transportation promulgate regulations requiring that all marine sanitation devices be designed to prevent the discharge of untreated or inadequately treated sewage.

F. Noise

As Timberlake develops and urbanization takes place, the noise level may be expected to increase to that of a moderate density development. The usual sources of noise such as blasting, drilling, compressor and heavy equipment operation, and traffic will be present during construction. The planned development approach to construction of the new community should help to reduce conflicts between activities in completed portions of the project and new construction areas. Open space, pathway systems, setbacks, earth berms, and buffered areas should reduce nuisance noise to the residents of the area.

In the long run, increased traffic will generate noise. Noise levels are expected to be highest on the roads which carry the largest volume of traffic through the site: U.S. Highway 411, State Route 72, Tellico Parkway, and the collector roads that will serve the community. As the industrial area develops, it is expected that there will be increased

rail and highway commuter and freight traffic in the immediate area of the industrial development.

The nearest airports are the Monroe County Airport and the Knoxville Municipal Airport. The Federal Aviation Administration has expressed the opinion that the Timberlake site would fall in Noise Zone 1, having a Composite Noise Rating of less than 100.⁵⁴ Therefore, it is anticipated that there would be no detrimental aircraft noise impact on future residents of Timberlake from aircraft using these airports. While control methods will depend on the details of the specific noise problem, detrimental effects from traffic noise on the local environment will be reduced by the strategic siting and scheduling of noisy operations for minimum impact, landscaping and design considerations, engineering controls such as acoustical mufflers and enclosures, appropriate traffic regulation, phased construction, legislative controls, and well-planned equipment maintenance programs. Concerted effort will be made to conduct appropriate studies and develop and implement regulations and standards to control noise levels within Timberlake.

TVA will place appropriate covenants and restrictions in deeds or other instruments for conveyance of land or landrights to control potentially detrimental noise generation.

II. SOCIOECONOMIC IMPACT

A. Employment Opportunities

Employment opportunities associated with Timberlake will have a positive impact on the economic welfare of the area.

The construction activity associated with the building of the new town is expected to have a moderate but consistent impact on the employment opportunities available in the area. Assuming an investment schedule that will accomplish the development program illustrated in table 1, estimated construction employment could average about 700 to 800 jobs per year.

As Timberlake develops, it will provide a sustaining industrial employment base and broaden opportunities for job selection. Although some jobs associated with the new community might have

occurred in the 3-county area without the project, it is forecast that new industrial employment opportunities could provide a net addition to employment of 4,000 to 6,000 jobs during the 20-year development period.⁵⁵ The impact of these employment opportunities, together with that of the estimated 600 to 800 jobs associated with the commercial recreational development, is expected to have a dramatic effect on the area. It is estimated that an additional 4,600 to 6,800 service and support jobs would be generated during this same period as a direct result of this basic employment gain.⁵⁶ Estimated cumulative employment opportunities are shown in table 30.

Timberlake is expected to enhance entrepreneurial opportunities in the area, and should increase the demand for contractors, wholesalers, financial institutions, insurance agencies, and allied services.⁵⁷ This increased demand should enable existing institutions to expand their operations and new institutions to emerge. It is expected that retail trade will be stimulated not only locally but also in the greater Knoxville area. The industrial development program planned for Timberlake should stimulate related development in the surrounding region. The project will provide the opportunity for more of the people in the area to become productive members of the work force.⁵⁸ It will lessen considerably the resources they must devote to searching for adequate and satisfying employment opportunity and should lead to more efficient use of the human resources of the region.

A comparison of the average wages of jobs in Blount, Loudon, and Monroe Counties in 1970 with projected earnings for jobs related to Timberlake indicates that the three-county average will increase during the 20-year development period. If the industrial employment goals for Timberlake are realized, new manufacturing jobs would provide average wage levels equal to the average wage for manufacturing workers in Blount County and the State of Tennessee and 25 to 55 percent higher than average wages from jobs in Loudon and Monroe Counties.⁵⁹

B. Population

The net population impact that Timberlake will have on the baseline projections shown in table 13 is dependent on several factors including: how fast job opportunities develop, how changing life styles affect future ratios of employment to population, what effects a long-term fuel shortage might have on commuter patterns, and what residential changes occur within the three counties. It is presumed that most of the population impact on the three counties will be closely related to the creation of new job opportunities. In addition, people who work elsewhere may choose to live in Timberlake, as may retired persons and owners of second homes. The population impact of the project on the three counties could range from about 31,000 to 42,000 people over the 20-year development period⁶⁰ (table 30). It is assumed that most of this additional population will choose to live within or near Timberlake,⁶¹ and it is estimated that the community would have a population of 24,000 to 30,000 people by the end of the 20-year development period.

C. Government and Institutions

The Timberlake site is adjacent to the small, incorporated community of Vonore (population 524) located along U.S. Highway 411. Two other incorporated communities, Lenoir City (population 5,324) and Loudon (population 3,728) are located just north and west, respectively, from the Tellico Dam site. TVA is cooperating with the Tennessee State Planning Office to assist in county-wide planning programs that include the municipalities. As part of this program, TVA will support and assist the towns, if they so desire, in planning for and adjusting to the impacts resulting from Timberlake.

Governmental services presently available in the Timberlake area are those commonly provided by county government, such as rural road maintenance, law enforcement, education, and limited public health service. Other services available include electric power and telephone service. It is anticipated that water, sewer, solid waste collection, and other

public services will be provided by agencies other than the counties as the new town develops. Except for water supply, no formal agreements have been reached concerning the provision of services and facilities.⁶² Certain general criteria have been established by TVA to guide the development of a governmental and institutional concept for Timberlake⁶³ in order to:

- (1) Provide the necessary degree of management control over the project by the developer during development and the mechanisms to facilitate transition of governmental control to the residents as the community grows,
- (2) Provide a means of generating sufficient revenues to cover service costs, yet be within the financial means of the users,
- (3) Be complementary to other official planning in the area,
- (4) Be acceptable to agencies and organizations responsible for its implementation,
- (5) Provide controls for enforcing and incentives for promoting attractive land utilization, urban design, and architecture, and
- (6) Provide for public regulation of services provided by nonpublic bodies.

1. New Community Legislation. Eventually, Timberlake will probably become an incorporated municipality. Tennessee has enacted permissive legislation, "The New Community Development Act," to provide for the governmental needs of new communities and to define the respective rights and responsibilities of new community municipal governments and developers. The Act provides for the setting of new community development standards by a state body known as the Tennessee Community Development Board (which held its first meeting in June 1974) and for the review of new community projects by the impacted local units of government. Also included in the legislation are requirements for the prevention or correction of adverse fiscal impacts on local units of government and a procedure whereby the residents of a new community may incorporate as a municipality. Timberlake may be developed under the provisions of the Act.

2. Tax Base.⁶⁴ Tennessee municipalities draw their revenue from a variety of sources. The following paragraphs describe possible revenue sources for Timberlake.

(1) While no specific arrangement to transfer land has been decided upon, it is anticipated that the greater part of new town land will gradually pass from public to private ownership, and in most cases, with high-value improvements added. The development program shown in table 1 was used as the basis for estimating the expected assessed value of taxable property within Timberlake. Table 31 shows that the assessed value of real and personal property in Timberlake by the end of the development period could be as great as \$148 million. An assessed value of this size would provide the capacity to carry a municipal debt large enough to finance substantial improvements, if the governing body chose to issue municipal bonds to finance them.

(2) The State of Tennessee shares a significant amount of state revenues with cities and towns. Upon incorporation, Timberlake would be eligible for a share of these funds, which in 1972 amounted to slightly more than \$22 per capita. At this rate, Timberlake would receive in excess of \$216,000 during its tenth development year and more than \$667,000 annually at the end of the 20-year development period.

(3) Another possible source of income is the local-option sales tax. Tennessee law permits local governments to levy up to a 1-3/4 percent local sales tax. The rate now imposed in Loudon and Monroe Counties is 1-1/2 percent.

(4) Some municipalities receive revenue from payments in lieu of taxes from public utilities and others. Timberlake may derive some revenue this way.

(5) Timberlake would be eligible for Federal general revenue sharing, or special revenue sharing or categorical grants, if in effect when Timberlake becomes a municipality.

(6) Timberlake may also raise revenues by means of fees for permits or licenses, or by special taxes.

The tax base of Timberlake will become substantial as the community grows, and Timberlake as a municipality would have the power to raise needed revenues in a variety of ways. However, the substantial investment required in the new community to provide public works facilities and municipal services in advance of a sufficient tax base will cause a temporary mismatch between necessary expenditures and actual revenues. This situation can be ameliorated by interim borrowing of funds or by direct public grants.

Timberlake will be located within two counties. Although the community government will be able to raise and allocate revenues on a municipal basis, a potential problem does exist with respect to schools, because most of the students would probably live in Loudon County while most of the industrial property, which is expected to yield a significant portion of the tax revenues, could be located in Monroe County. At the present time, Loudon, Monroe, and Blount Counties have joined together in the Little Tennessee Valley Educational Cooperative (LTVEC), which provides for cooperative educational planning and programming. Little Tennessee Valley Educational Cooperative enables the three counties to provide cooperatively services that they could not provide individually. If the counties choose to pursue this approach, it will be possible to plan educational facilities according to student needs without regard to county boundaries. TVA has supported this cooperative effort and will continue to support planning for providing and financing educational services on an equitable basis.

D. Public Services

1. Water System. A joint water system is being constructed by Loudon and Monroe Counties that will provide service to the new community area.⁶⁵ In formulating the comprehensive plan for development of the system, the expected water needs of Timberlake have been incorporated into the plan. TVA has pledged an initial tap fee up to \$500,000 to the Tellico Area Services Systems (TASS) for construction of a water treatment

plant near the mouth of the Tellico River and U.S. Highway 411 bridge (figure 13) as part of the construction for early developmental needs. Monroe and Loudon Counties have received grants totaling \$1,400,000 for the system from the Department of Housing and Urban Development and the Appalachian Regional Commission. In addition, the Farmers' Home Administration has approved loans totaling \$700,000 to the two counties.

2. Wastewater Treatment System.⁶⁶ It is expected that by the end of the 20-year development period, it will be necessary to provide treatment for about 11 million gallons per day (MGD) of wastewater from residential, commercial, recreational, and industrial sources. It is planned in the early years of the new community to treat wastewater in package treatment plants, located in the developing areas until the size and growth rate of the community is sufficient to warrant construction of a central treatment plant. This may occur between the first 7 to 12 years of the project as additions to the package plants become an uneconomic approach to treatment.

A treatment method and concept for the treatment plants will be selected from the systems available in the early 1980's; however, TVA has identified three alternative treatment methods which will satisfy Timberlake requirements and will provide alternative approaches for meeting wastewater quality objectives and be compatible with the site characteristics. The methods are:

- (1) Activated sludge with polishing pond
- (2) Activated sludge with advanced waste-treatment units
- (3) Physical-chemical

Schematic flow diagrams for these processes are shown on figure 21. The objective of the analysis was to identify treatment methods that will (1) meet water quality standards, (2) be cost effective, and (3) be reliable and flexible enough to be adaptable to flow variations, expansion, and the incorporation of new technology required by the Federal Water Pollution Control Act. The treatment methods are relatively close in overall merit.

Preliminary planning for Timberlake wastewater collection and treatment identified three alternative concepts in regard to the location of central treatment plant(s).

(1) Wastewater from the area primarily south of the Bat Creek Knobs would be pumped to a treatment plant located in the industrial area near river mile 16, and the treated effluent would be discharged into the Tellico Reservoir. The remaining wastewater from the area north of the Bat Creek Knobs would be pumped to a treatment plant on the Tennessee River, and the treated effluent would be discharged into Watts Bar Reservoir.

(2) All Timberlake wastewater would be transported to a single central treatment plant located in the industrial area on the left bank of the reservoir near river mile 16. The treated effluent would be discharged into Tellico Reservoir.

(3) All Timberlake wastewater would be pumped to a treatment plant on the Tennessee River, and the treated effluent would be discharged into Watts Bar Reservoir.

Each of these alternatives will be studied in more detail before final selection.

Regardless of the method and concept selected for treating Timberlake's wastewater, TVA through its landrights and authority under Section 26a of the TVA Act will assure that the system meets all requirements of Federal, state, and local regulations.

It is anticipated that wastewater from certain industries locating at Timberlake will require treatment before being processed through the central treatment plant. It is planned to employ a pretreatment management system, but no specific decisions have been made as to how it would function. Several alternatives are under study whereby the operating entity could:

(1) Contract with the industry to build and operate a pretreatment plant facility.

(2) Build the facility and lease it back to the industry for operation.

(3) Operate and lease or buy a facility built by the industry.

(4) Receive and treat waste from a facility built and operated by the industry.

The financing of the planning, design, construction, operation, and maintenance of the wastewater treatment system will probably involve the use of many sources of funds (figure 22). The critical time will be during the first few years of Timberlake when there are insufficient revenues to meet debt service plus operation and maintenance expenses. No specific arrangements have yet been made for funding the system. The physical facility will probably be financed incrementally as the system is expanded to accommodate Timberlake growth. The treatment plant, pump stations, and interceptors will be funded by a combination of governmental grants and local financing. For the Timberlake wastewater treatment system to be competitive and financially sound, it would have to receive a 60 percent grant subsidy to cover its capital requirements. The major source of these funds would normally be from a combination of Environmental Protection Agency basic grants and State of Tennessee supplementary grants. However, since correction of existing problems has priority in current EPA and state allocations of grant funds, the backlog of requests for grants may be such that Timberlake would have to seek alternative sources for its required grant funds. Funding of much of the collection system leading to the main interceptor line will be accomplished by incorporating the property development costs into the sale price of the improved land. No specific arrangements have been made at this time for the operation and management of the system; however, it is anticipated that the developer will work with the Tellico Area Services System for provision of this service. TASS can receive grants and proceeds from the sale of county bonds necessary to finance the system. The formula for developing the required revenues will require further study.

3. Stormwater System. A stormwater drainage system will be part of each development phase of the new community. The system will be separate from the wastewater sewerage system.

Standard techniques of design will be used as necessary to minimize sedimentation and pollution of water bodies.

4. Solid Waste. The quantity of solid waste generated by the residents and businesses of Timberlake will vary as a direct relationship to the population present and the types of businesses established. Assuming the population impact of the project shown in table 32, solid waste generation could grow from about 20,000 to 340,000 pounds per day (table 30).⁶⁷ A solid waste management system will be required to collect and transport solid waste materials to disposal and/or collection locations. Before incorporation, collection and disposal service could be provided by contracting with any existing public or private service system; if none exists, the developer is expected to sponsor provision of service. Upon incorporation of Timberlake, the city government will be responsible for providing service to the residents.

In the early years of development, a state approved sanitary landfill site in the area might be available for disposal use. A privately owned facility is the Red Ridge Sanitary Landfill located about three miles west of Timberlake. The site contains about 1,000 acres of land, but presently only 40 acres of the site are approved for landfill purposes by the Tennessee Department of Public Health. The facility is now receiving about 300 tons of refuse per day; and at this rate, the life expectancy of the 40-acre facility is estimated to be about five years. If other portions of this site are not approved by the State for landfill purposes, this site may not be useful as a disposal area. Monroe County owns a 200-acre site located about 12 miles south of Timberlake. The State has approved the site for landfill suitability. Planning for development of the site is in progress.

In the event there are no State approved disposal sites available, other means of waste disposal could be utilized. It is reasonable to assume that if the availability of suitable sanitary landfill sites decreases, emphasis will be placed on other disposal systems that will assure compliance with

applicable operating regulations. These alternatives, such as thermal processing and a resource recovery recycling system, will be considered in the design phase to determine the most suitable long-term solid waste management approach for Timberlake.

5. Energy. Activities associated with Timberlake are estimated to require an annual use of between 310 to 430 million kilowatthours of electrical energy by 1995.⁶⁸ Estimated electrical energy required in earlier years is shown in table 32. Estimated fuels and electric energy consumption per employee by the industrial groups shown in table 2 are shown in table 33.

Timberlake will be located in the service areas of the Loudon Utilities system and the Fort Loudoun Electric Cooperative (figure 18). Three possibilities for providing electric service to customers at Timberlake are:

- (1) Provision of service by the Loudon Utilities system and the Fort Loudoun Electric Cooperative, based on present service boundaries.
- (2) Provision of service by a new organization closely associated with the development of Timberlake.
- (3) An interim operating arrangement with both utilities for service during the early development period, and a change to a permanent arrangement at a later date. Whatever arrangement is agreed upon by the parties concerned, preliminary studies indicate that high start-up costs and extra costs associated with construction of underground distribution lines will require about \$4.5 million in supplemental financing over the first 15 years of the project if future retail rate levels are to be held reasonably close to the levels of adjoining areas. Public or quasi-public agencies other than the two utilities could provide this financing.

Timberlake is within the franchised area of East Tennessee Natural Gas Company. The company has indicated that it cannot make a commitment to provide a reliable supply of gas to Timberlake at this time.

6. Public Transportation. No public transportation system exists within the area of Timberlake. Preliminary studies indicate that the economic feasibility of providing a public transit system within Timberlake, under present public policy, would be questionable even in later years of the development period. However, to allow for the possibility of such provision in the future, a right of way will be reserved within the community. The land will be maintained as part of the open-space system until such time as a transit system may become feasible.

7. Other Facilities. Responsibility for law enforcement in the Timberlake area falls within the jurisdiction of the sheriff departments of Loudon and Monroe Counties. While these agencies or a Timberlake municipal police force must ultimately be responsible for providing such services to residents of Timberlake, supplemental services and assistance during the initial phases of Timberlake will probably be required from the developer. TVA has been providing limited assistance to law enforcement agencies in Loudon and Monroe Counties since September 1972 as part of the implementation of the Tellico Project.

There are no existing fire protection services available in the Timberlake area. Monroe County in cooperation with TVA is presently planning a Volunteer Rural Fire Protection Program for the County. That portion of Timberlake in the county would be serviced by fire protection units located in the Vonore area. Where no specific arrangements have been made, the developer is expected to provide or sponsor the establishment of a volunteer fire department in the early years of the project. Other services, such as postal and telephone services, are provided by the appropriate agencies. Civil defense and natural disaster planning will be incorporated into appropriate service plans.

E. Public Facilities

1. Education. Table 30 illustrates the number of students associated with the new community that might require education

from kindergarten through twelfth grade during the 20-year period.

Timberlake has the potential to help in the alleviation of educational deficiencies within the three-county area, particularly in small communities nearby. The seven local school districts have made substantial efforts to bring about educational improvement, and the emphasis on quality of education associated with Timberlake should help to further improve educational opportunities in the entire area. This emphasis can provide the opportunity for both residents and nonresidents to use the planned educational facilities for occupational training, handicapped and special education services, preschool programs, and media education.

A concept studied for Timberlake would place the majority of students in kindergarten through fourth grade in elementary centers within the neighborhoods, and students in grades five through twelve in larger educational centers. The elementary centers would each serve about 550 children, and each of the larger educational centers would be adequate to serve the general educational needs of about 2,000 students. The first two elementary centers could be at existing schools in Loudon open to children in the nearby communities, thereby allowing schools at Greenback, Vonore, Friendsville, and Lanier to be converted into elementary centers serving kindergarten through grade four. One of these larger centers would have special educational facilities necessary to serve both Timberlake and the region. These special purpose facilities could provide regional service for handicapped and exceptional children; community education, civic, cultural, and recreational activities; and vocational-technical training for high school students and adults.

Educational planning is being coordinated with the seven school superintendents, boards of education, city and county governments, officials of the Tennessee Department of Education, Little Tennessee Valley Educational Cooperative,⁶⁹ and

other interested agencies and institutions. Approximately 380 acres of land will be reserved within Timberlake for educational facilities. TVA will provide consulting services for the planning and design of educational facilities for Timberlake, if required.

2. Health. The 3-county area has an adequate supply of hospital beds to meet the demand associated with Timberlake during the first 5-year development phase. A study will be conducted during the second phase of planning to determine the need for a community hospital in Timberlake.

The development of Timberlake will increase demands for primary health care, which is now in short supply in the project area. A primary health care center will be planned for Timberlake to meet this increased demand, and will include family medical care, emergency treatment, pediatric care, dental care, mental health services, rehabilitation, medical-social work, multiphasic health testing, and health education. Quality of care and efficiency could be enhanced by providing centralized management and support services for those who have offices in the center. Planning and operation of the center would be coordinated and integrated with other elements of the health care system in the area and the Tennessee Department of Public Health.

The plan for providing medical care and other health services for Timberlake will be accomplished in stages and employ modular building concepts so that services can be consistent with the population growth and other factors influencing service requirements.

3. Recreation. Approximately 3,700 acres or about 23 percent of the site will be devoted to the development of public and private recreational facilities. Most facilities will be available to the general public. Recreational opportunities will include swimming pools, riding and pedestrian trails, marinas, campgrounds, cabins and resort accommodations, a golf course, and other outdoor facilities; possible acreage utilized by various recreational activities is shown in table 34.⁷⁰

The State of Tennessee has considered building a state park in the area. Neighborhood recreational areas will be developed, and an open-space system will thread throughout the community. Recreational planning is being coordinated with the Tellico Area Planning Council, East Tennessee Development District, Tennessee Department of Conservation, U.S. Forest Service, and the National Park Service.

F. Impact on Social and Cultural Environment

The development of Timberlake will be made in a manner which will have a favorable impact on the social and cultural environment of the area.

1. Urbanization and Available Housing Choices. Although the greater Knoxville area (SMSA) is experiencing the same type of suburban sprawl that is taking place in many large cities today, the area proposed for Timberlake has not yet been subjected to such pressures. Recent residential and commercial growth trends in the southwestern part of the SMSA and new highways being built or planned in the Timberlake area indicate that greater development pressure is likely to occur in the future. Some suburban development is occurring near the Timberlake area and on the periphery of the Great Smoky Mountains National Park. The types of housing being constructed indicate a demand for a wide choice of housing types and prices at Timberlake. It is estimated that 11,000 to 16,000 housing units will be required at Timberlake over the 20-year development period (table 30).

2. Neighborhood Composition. Through careful design, the development of Timberlake will offer the opportunity to create a community with an equitable integration of society at the neighborhood level: economically, racially, and socially. A neighborhood will consist of 1,200 to 2,500 dwelling units depending on density, and neighborhood balance will be achieved by providing a variety of styles and prices for dwellings within each neighborhood. This approach to developing neighborhoods should produce a socioeconomic balance as well as provide equal access to neighborhood amenities for all residents.

3. Citizen Participation. Although much of the planning must be done before construction of a new community begins, it is important that the residents have a voice in how the community evolves. A nonprofit citizen's association would serve as a forum for discussions between the resident and the developer and could, in the early years, serve as an agency for providing certain services to the residents on a fee basis. Management and maintenance of neighborhood facilities and open spaces could be one of the functions of the association. In the early stages of development, the developer would have to take a leadership role in the association to protect its initial investment and to assure that project objectives are pursued. However, community control and operating responsibility would gradually be transferred to the residents. Upon incorporation, the resulting municipality could acquire the assets and liabilities of the association. The charter of the association would contain provisions for sharing and transferring functional responsibilities to the municipality that might emerge.

4. Small and Minority Business. The building of Timberlake facilities will increase the volume of local construction business. TVA will ensure that small and minority builders have an equal opportunity to participate in this activity. The Knoxville Area Urban League is a member of the Timberlake Advisory Board, and TVA will cooperate with it to compile a list of qualified minority builders to be notified of business opportunities during the development period.

5. Historic Values, Archaeological Restoration and Protection. Timberlake is not expected to have an adverse effect on the historic and cultural heritage of the three counties nor those historic structures and former sites on or near the project site (figure 12). On the contrary Timberlake will provide opportunities to ensure proper recognition, appropriate preservation, and utilization of this heritage. Information being obtained by TVA through archaeological surveys and historical and cultural studies being done as part of the

Tellico project will be incorporated into Timberlake planning to ensure full consideration of this value. TVA will design its development standards and procedures to enhance and protect significant historical features. A chronological list of Historical and Cultural Features in the Timberlake area and the current status of each is shown in table 35.

ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED
SHOULD THE PROPOSAL BE IMPLEMENTED

As the Timberlake site is transformed from a rural area to a planned new community, changes in its environment will take place, and certain of the impacts described in the preceding sections, which may be considered to be adverse, will be unavoidable.

Development of facilities will prevent use of the land for agricultural or sustained timber production. The increased number of people and their activity will cause shifts in the population of wildlife and reduction in their numbers on the site. The movement of wildlife to adjoining habitat may create competition for food and cover which would probably result in the reduction of those animals that cannot find suitable habitat. Given the forecast extended development pace for Timberlake, the displacement of wildlife should be quite gradual.

The operation of equipment for construction and the far greater number of motor vehicles that will be in the area will create airborne dust and fumes, as will emissions from the industrial, residential, and commercial developments. Treated wastewater from the community will be discharged to the reservoir. The adverse effects of these impacts will be minimized through the application of restrictive covenants and controls as well as by compliance with applicable Federal and other regulations.

The impacts of urbanization that will be felt in the Timberlake area will be reduced because of the careful advance planning and commitment to the objective of providing a quality environment for the community.

ALTERNATIVES TO THE PROPOSED ACTION

If the Tellico Reservoir shorelands were not to be used for the development of the Timberlake new community, the available alternatives would include leaving the land in an essentially undeveloped state or using it for certain of the purposes included in the proposed program, either individually or in various combinations. The impacts associated with each of these alternatives would be of the same type as would result from implementation of that aspect of the proposed project. However, it is possible that the adverse effects could not be lessened to the same extent in the absence of the comprehensive planning and stringent regulation and controls that will be part of the proposed project. The most significant difference between the effects of the proposal and the alternatives is the loss of the benefits to be realized from Timberlake, including the creation of a viable community of high quality and the demonstration of the feasibility of this approach and experience which could be useful in other parts of the Nation.

A. Industrial Development

Assuming an industrial development program similar to that which is part of the proposed action, this alternative could require about 4,000 acres of the site to be used for industrial purposes. The other 12,000 acres of the site would remain essentially as it is now with minimum impact until it was made available for some future use.

The effects on air and water quality at the site would be substantially the same as for the proposed plan. The principal sources of emissions would be from the industrial plants and vehicular traffic.

It is estimated that this alternative could provide a net addition of 4,000 to 6,000 jobs in manufacturing employment during the 20-year development period. Nonmanufacturing service and support jobs directly associated with this increase in basic employment could provide an additional 4,000 to 6,000 jobs. Investments in industrial plants could have an assessed value estimated between \$27 and \$42 million by the end of the 20-year development period (table 29).

Although the population impact on the 3-county area would be less than for the proposed action, it would still range from 21,000 to 32,000 people. Some 8,000 to 12,000 new housing units would be required in the nearby towns and unincorporated area. Low density rural sprawl and uncontrolled strip development of businesses along the major roads could occur. It would be difficult and costly for the local government to provide the necessary services.

The attractiveness of a region to an industry seeking to locate new or expanded operations is influenced by the availability of adequate public services, housing for employees and other amenities. The lack of a comprehensive approach to providing these factors would make it more difficult to attract the more desirable industries and higher paying jobs.

B. Public and Commercial Recreational Development

This alternative would involve the use of about 5,000 acres of the site for a broad range of recreation development including public parks, nature and hiking trails, and historic sites, and commercial facilities such as marinas, lodge and cabin resorts, campgrounds and supporting services and accommodations. The development would serve primarily local visitors and vacationers. A vacation community could be developed as part of the program, with lots sold to individuals for the construction of second homes. The remaining land would be left in its present state or used for limited agricultural or timber production.

It is estimated that this alternative would provide about 1,300 job opportunities over a 20-year period.⁷² Many of these jobs would be seasonal only and generally would pay less than industrial jobs. The assessed value of real property could be about \$19 million by the end of the development period.

The owners of the second homes might eventually choose to become year-round permanent residents, thereby placing unexpected demands on public services and facilities. Because the public utility facilities would have to be sized

to accommodate the peak seasonal needs, it is likely that the cost of year-round services would have to be higher.

C. Public Recreational Development

The entire area surrounding the Tellico Reservoir could be used for public outdoor recreation. Portions of the shoreline would be developed to provide access to the reservoir for fishermen, boaters, and water skiers, and swimmers. Campgrounds and trails would be built, but most of the land would remain unchanged.

This alternative would offer many similar types of recreation opportunities, such as hiking, picnicking and camping that are presently available on the 1.1 million acres of public lands in the Great Smoky Mountains National Park and the Cherokee National Forest.

It is estimated that only 600 to 1,000 jobs would be created by this alternative. Some minor commercial services could be provided within the project area but most commercial services would be found near the periphery and in strip development along the highways leading to it.

D. Residential Subdivision Development

Various parts of the Timberlake site could be used for conventional residential subdivisions, tracts with suburban estate-type lots and areas for second homes or private recreation use. Some 2,000 to 3,000 acres could probably be developed in this manner with the rest of the proposed site unaffected.

In the absence of the economic stimulus to be provided by Timberlake, especially the new job opportunities, it is estimated that the housing demand would amount to only 4,000 units over a 20-year period. Most of this market would probably be directed toward waterfront home sites.

It is not likely that this size market would attract the long term participation of a large private developer so that economies of scale could be realized. The tax base created under this alternative probably would not justify the cost of providing a full range of urban services, and the unit cost of providing utilities would be quite high.

E. No Development

The alternative of taking no action, which would cause the least physical change to conditions existing on the site, would also make the least contribution to the regional economy and provide the minimum stimulus to other public action or private endeavor. Even if no action were taken by TVA for the use of the Timberlake area, it is probable that people would continue to use the existing road system for access to the reservoir and other parts of the site, and that unacceptable conditions would result. It probably would then become necessary either to close the entire area (an unacceptable if not impossible choice) or to provide the minimum facilities and required maintenance to relieve problems of sanitation, public safety, and property protection. The amount of continued public use would be dependent on the extent of development and service provided.

It would probably also be possible to convert the lands which had been used for agricultural purposes before their acquisition as part of the Tellico project back to such use. The 16,000 acres of the Timberlake site had estimated farm sales of \$768,000 in 1964, and the amount could be considerably higher if they were returned to such use now.

RELATIONSHIP BETWEEN LOCAL, SHORT-TERM USES
OF MAN'S ENVIRONMENT AND THE
MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The planning and establishment of a viable community is by its nature a program with long-range goals. The program does not represent a short-term use of the environment that will jeopardize long-term productivity. Rather, it represents the use of the land and other resources of the area to enhance economic and social growth. The cumulative effect of Timberlake will be to supplement other efforts for development of the region and to realize in full measure the potential of the Tellico Reservoir shorelands.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS
OF RESOURCES THAT WOULD BE INVOLVED IN THE
PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Timberlake will require the permanent commitment of the 16,000-acre site to community development. Although it will use resources of labor and materials to build and support the community, it is probable that these resources would have had to be committed elsewhere, and probably in a less efficient manner, to meet the needs of the people who will become residents of Timberlake.

FOOTNOTES

1. In honor of Henry Timberlake, British Army officer, whose memoirs provided valuable information and maps of the Little Tennessee Valley during the period 1756-1765.
2. For a description of the physical characteristics of the Tellico Project and its development objectives and potentials, see U.S., Tennessee Valley Authority, Tellico Project Environmental Statement - OHES-EIS-72-1 (Chattanooga, Tennessee, February 10, 1972).
3. The council was organized by local officials and the Tennessee State Planning Office (TSPO) in May 1967. The council is comprised of equal representation from Blount, Loudon, and Monroe Counties and is served with technical assistance by the TSPO.
4. In developing the feasibility of a partnership between the public and private sectors, TVA and The Boeing Aerospace Company, A Division of The Boeing Company, jointly studied the respective roles of the public and private sectors in the development of Timberlake during the period September 1973 to March 1975.
5. Anderson, Blount, Knox, and Union Counties, Tennessee.
6. Owned by the Aluminum Company of America.
7. Gladstone Associates, "Timberlake City 1972 Program Formulation - Working Papers No. 1972 - I, II" (Unpublished, Washington, D.C., March 20, 1972), pp. 16 and 32.
8. Economic Research Associates, Demand Analysis for Recreation Development in the Tellico Reservoir Region (Washington, D.C., November, 1971).
9. Ibid.
10. Executive Office of the State of Tennessee, A Recreational Development Plan for the Little Tennessee River Valley, August, 1973.
11. U.S., Tennessee Valley Authority, An Appraisal of the Industrial Development Potential for Timberlake (Knoxville, Tennessee, January 1972), p. 42; and Real Estate Research Corporation, Industrial Potential the Timberlake New Community East - Central Tennessee (Chicago, Illinois, April 1972), p. 35; and the Fantus Company, Report on Timberlake, Tennessee (South Orange, New Jersey, April 1972), p. 19.

12. Flexibility in the overall land use plan is required, for example, because: (1) during a long-term public-private relationship, desires and decisions mechanisms will many times, by circumstances or necessity, be out of phase, and if initially too rigid could require the parties to engage in a time consuming, expensive amendment process; (2) the dynamic interactions between the major social, economic, political, and technological changes and objectives could alter market preferences over time; and (3) deliberate planning in each stage of development will be necessary to take into consideration the needs of the emerging population, to react to markets and, to gain economies of scale.

13. Presently Timberlake Advisory Board membership includes representatives from the following organizations: Department of Housing and Urban Development; East Tennessee Development District; Knoxville Area Urban League; Monroe County Industrial Development Commission; Office of Urban Affairs, University of Tennessee; Office of Urban and Federal Affairs, State of Tennessee; Tennessee Staff Division for Industrial Development; Tellico Area Planning Council; Tennessee State Planning Office; and TVA.

14. Examples of other staffs which may be involved in the planning process are: Department of Health, Education, and Welfare; Department of Housing and Urban Development; Tellico Area Planning Council; Little Tennessee Valley Educational Cooperative; Municipal Technical Advisory Service (University of Tennessee); Government-Industry-Law Center (UT); Technical Assistance Center (UT); Tennessee State Planning Office; East Tennessee Development District.

15. U.S., Tennessee Valley Authority, An Appraisal of the Industrial Development Potential for Timberlake (Knoxville, Tennessee, January 1972), pp. 46-52.

16. The research approach used produced a prospect list that resulted in an industrial mix that could reasonably be expected to consider locating in the eastern Tennessee Valley region and specifically Timberlake. Certainly, the analysis was not designed to isolate those industries which may have one or several location requirements that completely overshadow all others and therefore, would cause them to

locate at Timberlake. For example, the project's success would not necessarily have to be dependent solely upon the location of water-oriented industries such as large water, power or barge users, or upon the occurrence of complex-triggered development; however, the fact that the Tennessee Valley region has numerous examples of industries locating for just these very reasons should reinforce the expectation that the in-place industrial mix would no doubt include other industries and industry groups. TVA has every expectation that as the Timberlake program matures, productive interrelationships between industries will occur and thereby serve as an additional location attraction.

17. S. T. Algermissen, Seismic Risk Studies in the United States, (U.S. Department of Commerce, Environmental Science Services Administration, 1969).

18. By definition, moderate earthquake damage could be expected in Zone 2 that would correspond to an intensity of VII on the Modified Mercalli Intensity Scale of 1931. The effects designated an intensity of VII shock are: "Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars." A shock of this intensity corresponds to one with a Richter magnitude between 5.2 and 5.7 and would have a ground acceleration of approximately 0.1 gravity. H. O. Wood, and F. Neumann, Modified Mercalli Intensity Scale of 1931 (Seismol. Soc. American Bull., vol. 21, 1931), pp. 277-283.

19. Information about zinc ore reserves in reference to the Eve Mills prospect is contained in Investigation of Eve Mills Zinc Deposit, Monroe County, Tennessee, Richard Sayrs, U.S. Bureau of Mines, "Report of Investigation 4411" 1949.

20. R. E. Witwer, Tellico Test Site Land Use Map. Technical Report 69-4, Commission on Geographic Applications of Remote Sensing, (East Tennessee State University, Johnson City, Tennessee, 1970); in 1969 farm operations in the three-county area included 242,000 acres of farm land. Of this, 24 percent was forested, 7 percent noncultivated pasture, 63 percent cultivated cropland, and 6 percent other uses. Major crops included corn, soybeans, hay, vegetables, and tobacco.

21. U.S., Tennessee Valley Authority, Tellico Project Environmental Statement, TVA-OHES-EIS-72-1 (Chattanooga, Tennessee, February 10, 1972).

22. "The American Forestry Association's Social Register of Big Trees," American Forests, April 1973.

23. According to W. R. Allen, "Wood Duck production on . . . (this area) is fair to poor. Nesting habitat is poor and food quantities are questionable." See W. R. Allen, "The Eastern Valley Waterfowl Resource: Its History Management, and Future Development" (Unpublished TVA Report, Knoxville, Tennessee, 1971), p. 34.

24. R. M. Jenkins, Proceedings of Reservoir Fishery Resources Symposium, The Influence of Some Environmental Factors on Standing Crop and Harvest of Fishes in U.S. Reservoirs (Athens, Georgia, 1967).

25. Tellico Project Environmental Statement, op. cit., p. I-1-17.

26. For a further discussion of archaeological values, see the Tellico Project Environmental Statement, op. cit., pp. I-1-35-38.

27. Items (1) through (4) are identified in the East Tennessee Development District's "Public Improvement Program" document dated March 1973. On October 29, 1973, ETDD recommended the construction of the bridge below Chilhowee Dam as one of three most needed Appalachia Regional Commission program local access projects in the district. (Letter from John W. Anderson, Jr., Executive Director, ETDD, to Mike McGuire, Director of Regional Development, TSPO, Nashville, Tennessee, October 29, 1973).

28. Tellico Area Planning Council meeting minutes, March 19, 1968, p. 3.

29. The Tennessee Department of Transportation is presently considering a new program for improvement of this highway from the terminus of existing State Route 95 to Morgantown Road just west of U.S. Highway (Maryville By-pass) (Letter from Ben L. Smith, Tennessee Department of Transportation, Nashville, Tennessee to TVA, February 7, 1974).

30. Contract between Loudon County, Tennessee, and Monroe County, Tennessee, Relating to the Tellico Area Services System (December 3, 1970).

31. John Coleman Hayes, Jr., and Associates. Proposed Comprehensive Plan for a Water System Development Tellico Area Services System (Nashville, Tennessee, June 19, 1971).

32. Dr. Jerome Pickard, "Population in Appalachia and the United States Year 2000," Appalachia, Volume 5, Number 7 (July-August, 1972), 17.

33. Data not available for publication for individual counties in Standard Metropolitan Statistical Areas (SMSA). Blount County is a part of the Knoxville SMSA.

34. As noted, relatively high wages in Blount County are due, to a great extent, to the ALCOA facilities.

35. No data available for Blount County.

36. U.S., Department of Commerce, Census of Business 1963, 1967 and 1972 (Washington: Government Printing Office).

37. East Tennessee Development District, The Need for Short Term General Hospital Beds, 1980 (Knoxville, Tennessee, July, 1973), pp. 5-7.

38. C. Kenneth Tanner, A Survey of the Seven Tennessee Public School Systems in Blount, Loudon, and Monroe Counties (The University of Tennessee, 1970) pp. 69-88.

39. Tellico Area Planning Council Minutes, March 19, 1968.

40. Blount, Loudon, and Monroe County Planning Commissions, Comprehensive Plan Blount, Loudon, Monroe Counties, Tennessee, Report No. ET-SA-5-70 (Knoxville, Tennessee, June 1970), pp. 33-35.

41. East Tennessee Development District, Alternatives for Land Use - ETDD, Report No. ET-6-70 (Knoxville, Tennessee, March 1970).

42. See Contract Between Loudon County, Tennessee, and Monroe County, Tennessee, op. cit.

43. In April of 1973, the Tennessee General Assembly adopted and the Governor signed a resolution (HJR No. 244) directing the State Planning Office investigating the legislation necessary for sound state land use planning, to review alternate methods for implementing a land use program in the future, and to report its findings and recommendations to the Eighty-Eighth General Assembly by January 1, 1974. HJR No. 244 further directed the appointment of a special legislative advisory committee to assist in the study. In January 1974, companion bills SB 1654 and HB 1623 were introduced in the General Assembly.

These bills would establish the Tennessee Land Use Commission as an interior vehicle to study, assess and develop viable solutions to land use problems in Tennessee and to recommend to the General Assembly legislation deemed necessary to institute an effective state land use planning and management program. To date, SB 1654 and HB 1623 have not been scheduled for consideration on the floor of the house of the General Assembly.

44. Statistical information obtained from National Park Service.

45. U.S., National Park Service, Planning Directive - Proposal for Preparation of a Master Plan and Environmental Statement: Great Smoky Mountains National Park (October 2, 1973), p. 1.

46. U.S., National Park Service, (Great Smokies Regional Planning Team) "Initial Draft--Coordinated Guidelines for Recreation Resource Use in the Great Smoky Mountains Region," (Unpublished), pp. 112-114.

47. Families living on the site have been relocated during construction of the Tellico project with the exception of a few families who are occupying homes on a tenancy basis under annual licensing agreements. All occupants of land purchased by TVA will be relocated by the end of Dec. 1976.

48. Agreement Between Tennessee Valley Authority and Tennessee State Planning Commission Relating to Planning Assistance for Loudon and Monroe Counties - Contract No. TV-36693A (Knoxville, Tennessee, July 1, 1972).

49. U.S., Tennessee Valley Authority, Forest Inventory Statistics, Lower Little Tennessee River Tributary Area, Forestry Bulletin No. 118, (Norris, Tennessee, 1964).

50. William R. Allen, "The Eastern Valley Waterfowl Resource: Its History, Management, and Future Development" (Knoxville, Tennessee, unpublished TVA Report, March 31, 1971), p. 34.

51. For a discussion of the expected water quality characteristics of Tellico Reservoir, see Tellico Project Environmental Statement, op. cit. p. I-1-28-31.

52. Roger P. Betson and Robert A. Buckingham, "Fecal Coliform Concentrations in Stormwater," TVA.

53. During this period over 104,000 barges passed through locks on the Tennessee River System. (Source: Corps of Engineers, U.S. Army, Nashville District.)

54. Based on correspondence between Airports District Office, Federal Aviation Administration, DOT, Memphis, Tennessee, and TVA.

55. U.S., Tennessee Valley Authority, An Appraisal of the Industrial Development Potential for Timberlake (Knoxville, Tennessee, January 1972), p. 42; and Real Estate Research Corporation, Industrial Potential the Timberlake New Community East - Central Tennessee (Chicago, Illinois, April 1972), p. 35; and the Fantus Company, Report on Timberlake, Tennessee (South Orange, New Jersey, April 1972), p. 19.

56. Gladstone Associates, "Timberlake City 1972 Program Formulation - Working Paper No. 1972 - I, II" (Unpublished, Washington, D.C., March 20, 1972), p. 16; and U.S., Tennessee Valley Authority, "Impact of Timberlake on Socioeconomic Environment for Selected Categories in the Three-County Area" (Unpublished, Knoxville, Tennessee, November 1973).

57. Chamber of Commerce of the United States, What New Jobs Mean to a Community (Washington, D.C., 1973), pp. 5-12. In a report compiled by a task force appointed by the Executive Office of the State of Tennessee, the impact on the 16-county East Tennessee Development District from net addition of 6,100 jobs associated with the Tellico Project and Timberlake for the period 1975 to 1980 was estimated to be: "Construction rate went from 1.6 percent to an increase of 8.3 percent; manufacturing and trades and services at a rate 25 percent higher than anticipated . . . without Timberlake." A Recreation Development Plan for the Little Tennessee River Valley, August 1973, p. 21.

58. It is expected that the employment to population ratio in the three-county area will move toward the Knox County (Knoxville) ratio as the new community matures. (Current baseline projections indicate that in the year 1995 employment to population ratio for the three counties and Knox County will be 0.379 and 0.387, respectively.) Executive Office of the State of Tennessee, op. cit., p. 22 reported: "Percent of families with incomes of less than \$5,000 in 1980 declined . . . from 8.8 percent of all families to 8.5 percent because of Timberlake."

59. Based on studies made by TVA using wage data for industries identified in table 2 of this statement and adjusting the data using Tennessee Department of Employment Security information.

60. U.S., Tennessee Valley Authority, "Impact of Timberlake on Selected Categories of the Socioeconomic Environment of its Three-County Area," (Unpublished, Knoxville, Tennessee, February 1974). Also the Executive Office of the State of Tennessee, op. cit., p. 22 reported: "Without them (Timberlake jobs) the district (ETDD) experienced a net migration loss of 2,700 for the period 1970 to 1980. By including Timberlake, this net migration of 5,106. At the state level a similar reversal occurs (-600 to +7,024), . . . Population for the ETDD is 17,000 higher than the expected . . . by 1980."

61. The distribution of Timberlake residents to individual counties will depend greatly on the land-use plan for Timberlake as finally developed over the 20-year development period.

62. Agreement Between Tellico Area Services System and Tennessee Valley Authority Relating to Construction of Water System - Contract No. TV-37837A (Knoxville, Tennessee, May 10, 1973).

63. The following organizations are expected to be involved in some degree in planning for and/or providing services to Timberlake. Some of the organizations presently exist and are functioning; others are in their infancy, while others are still to be created: State of Tennessee; county courts of Loudon, Monroe, and Blount Counties; seven school boards within the three counties; Tellico Area Planning Council; The Little Tennessee Valley Educational Cooperative; two electric power utilities; Tellico Area Services System; and later the Timberlake Citizen's Association and the Municipality of Timberlake.

64. U.S., Tennessee Valley Authority, "Timberlake Municipal Property Tax Base Forecast," (Unpublished, Knoxville, Tennessee, January 1974).

65. John Coleman Hayes, Jr., and Associates, op. cit.

66. U.S., Tennessee Valley Authority, "Timberlake Hydro-Waste System Conceptual Plan," (Unpublished, Knoxville, Tennessee, December 1973).

67. Assumes a solid waste generation of five pounds per capita per day in Phase I of the project increasing to eight pounds in Phase II. (Based on "EPA Report SW-65ts, 'Sanitary Landfill Design and Operation,' 1972, Brunner and Keller.") These per capita generation rates include residential, commercial, and institutional solid wastes,

but not industrial, mining, agricultural, and construction wastes. Commercial mining or agricultural wastes are not expected to be significant within Timberlake. The quantity of solid waste generated from construction activities is difficult to predict due to the limited data available on solid waste generation at construction projects; therefore, no estimate of quantity of these wastes is needed. The list of industries shown in table 2 is prospective in nature, and it is not practical to speculate as to which specific industries would actually locate within Timberlake, nor on quantities of solid waste each might generate. The most economical disposal system available for each specific industry that will assure compliance with current applicable solid waste management regulations will be utilized.

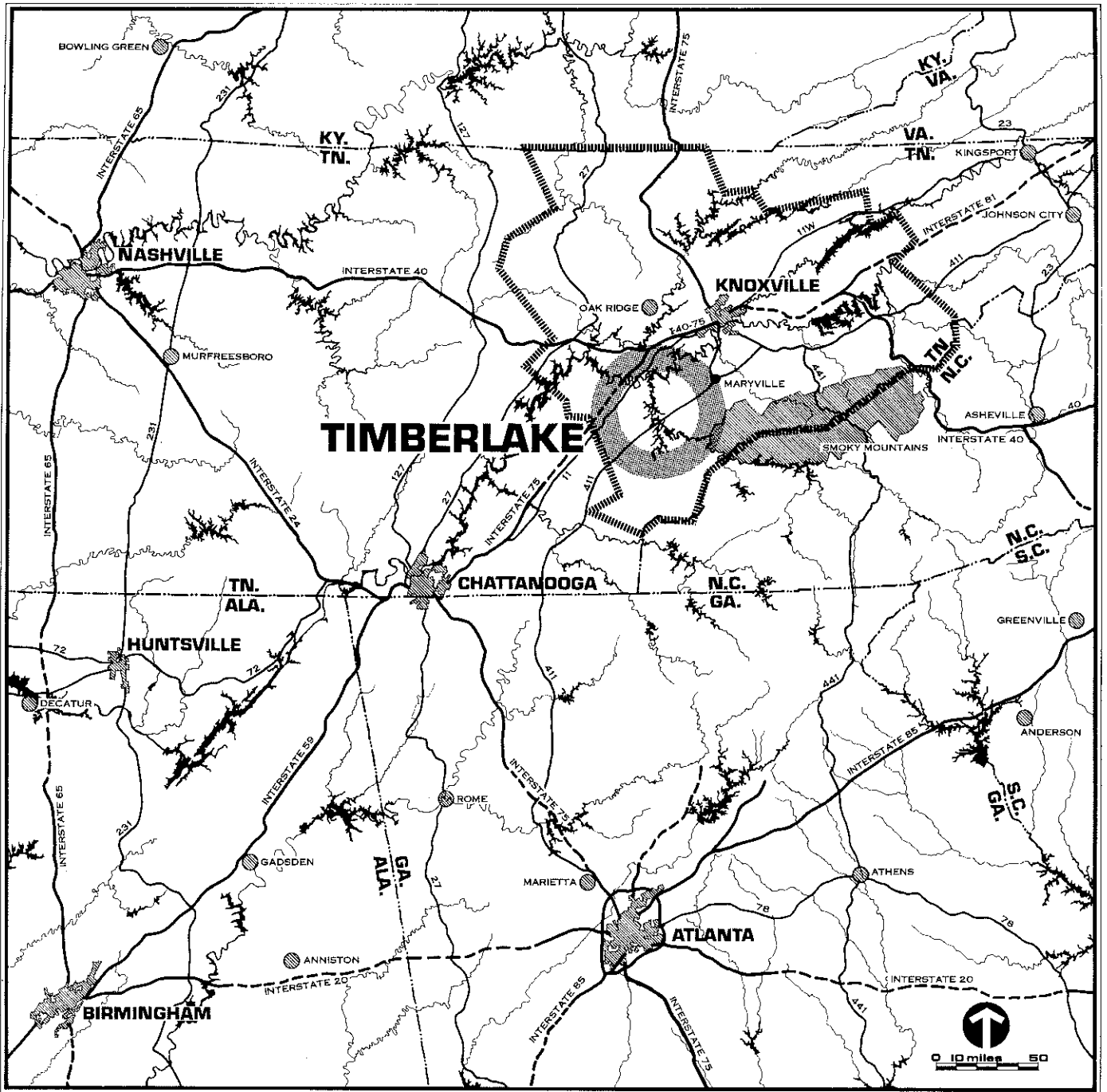
68. Assuming the development program shown in table 1, activities at Timberlake will account for about 90 percent of this demand in 1995.

69. Educational planning for the tri-county area has been underway since 1970 through the Little Tennessee Valley Educational Cooperative.

70. Economic Research Associates, Recreation Development Plan . . ., op. cit.

71. Gladstone Associates, op. cit., p. 16.

APPENDIX A



REGIONAL LOCATION



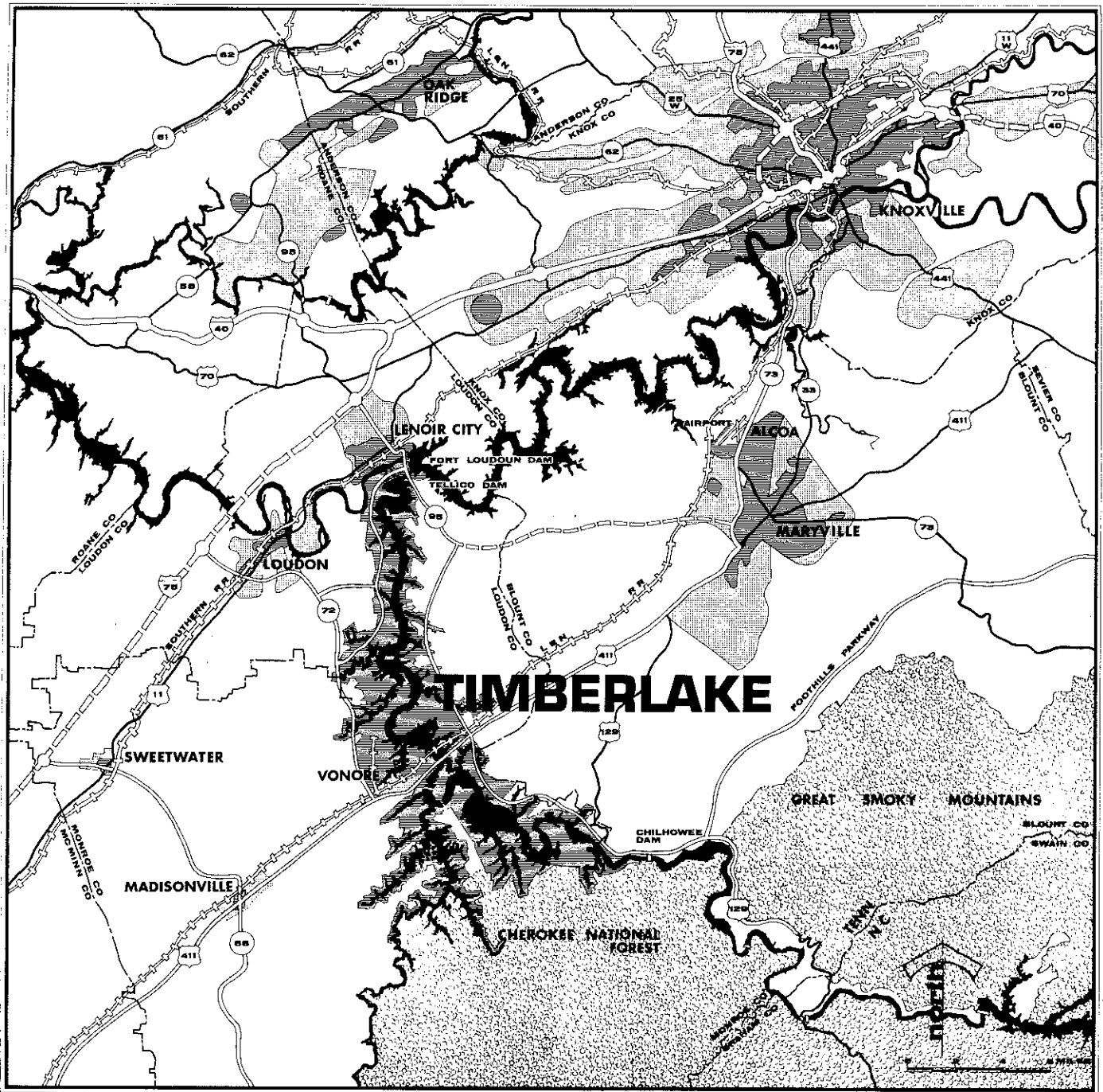
-  MAJOR CITIES (POPULATION OF 100000 AND UP)
-  MINOR CITIES (POPULATION OF 25000 TO 100000)
-  EAST TENNESSEE DEVELOPMENT DISTRICT BOUNDARY
-  STATE BOUNDARY LINES
-  MAJOR HIGHWAYS

FIGURE 1



AREA LOCATION




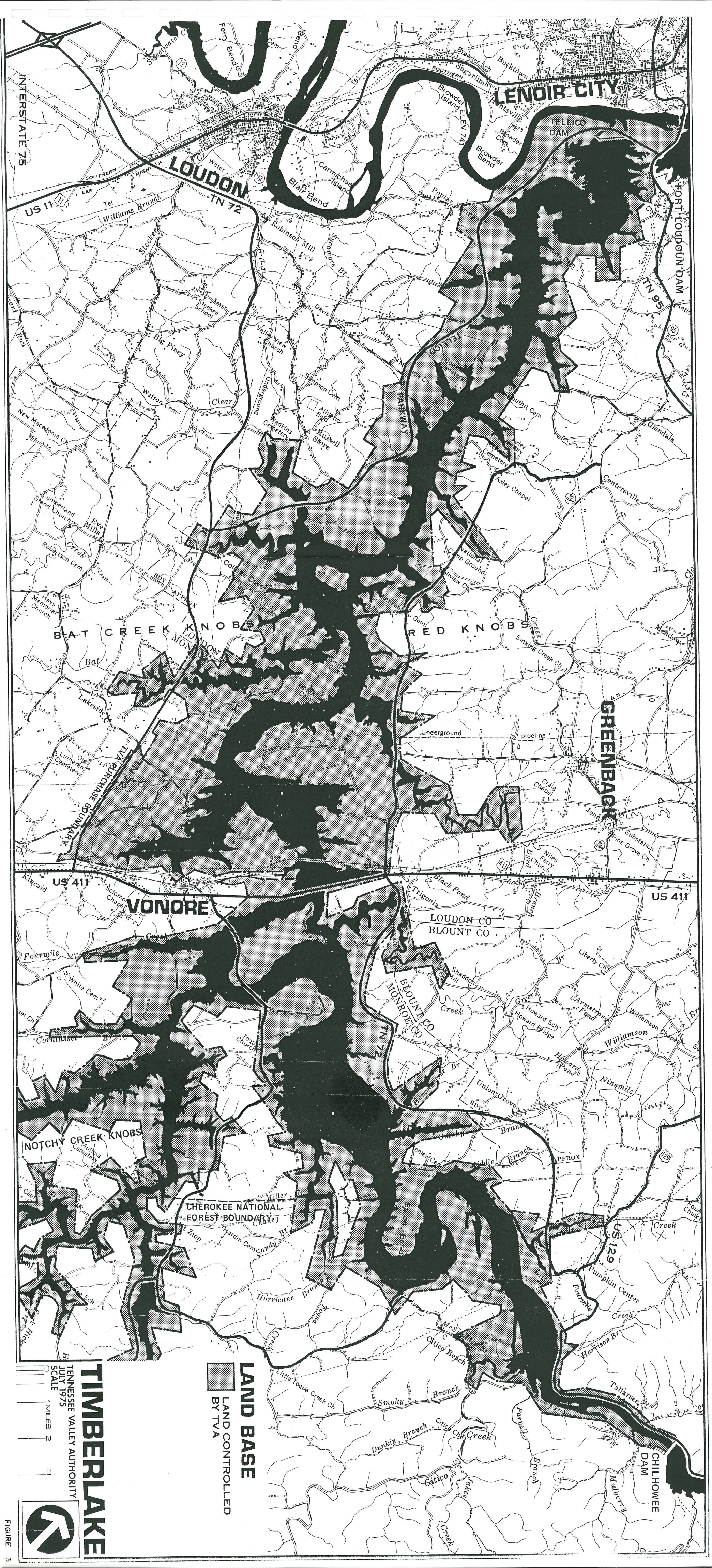
-  EXISTING URBAN DEVELOPMENT.
-  1980 URBAN DEVELOPMENT.
-  TIMBERLAKE

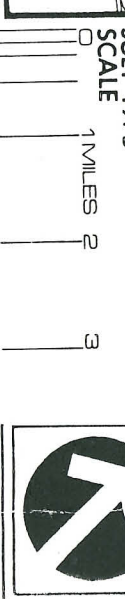
FIGURE 2

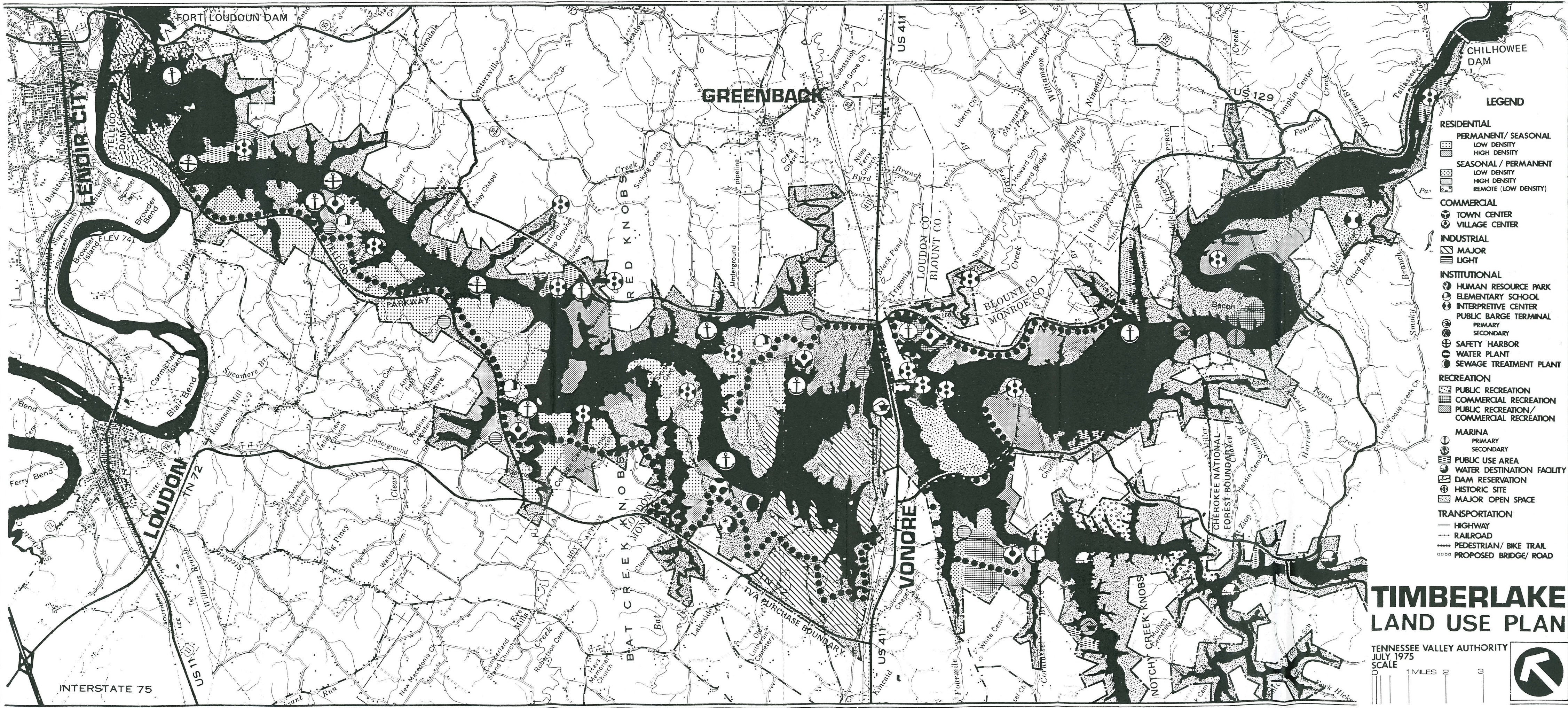


TIMBERLAKE

TENNESSEE VALLEY AUTHORITY
 JULY 1975
 SCALE 1 MILES 2 3

LAND BASE
 LAND CONTROLLED
 BY TVA





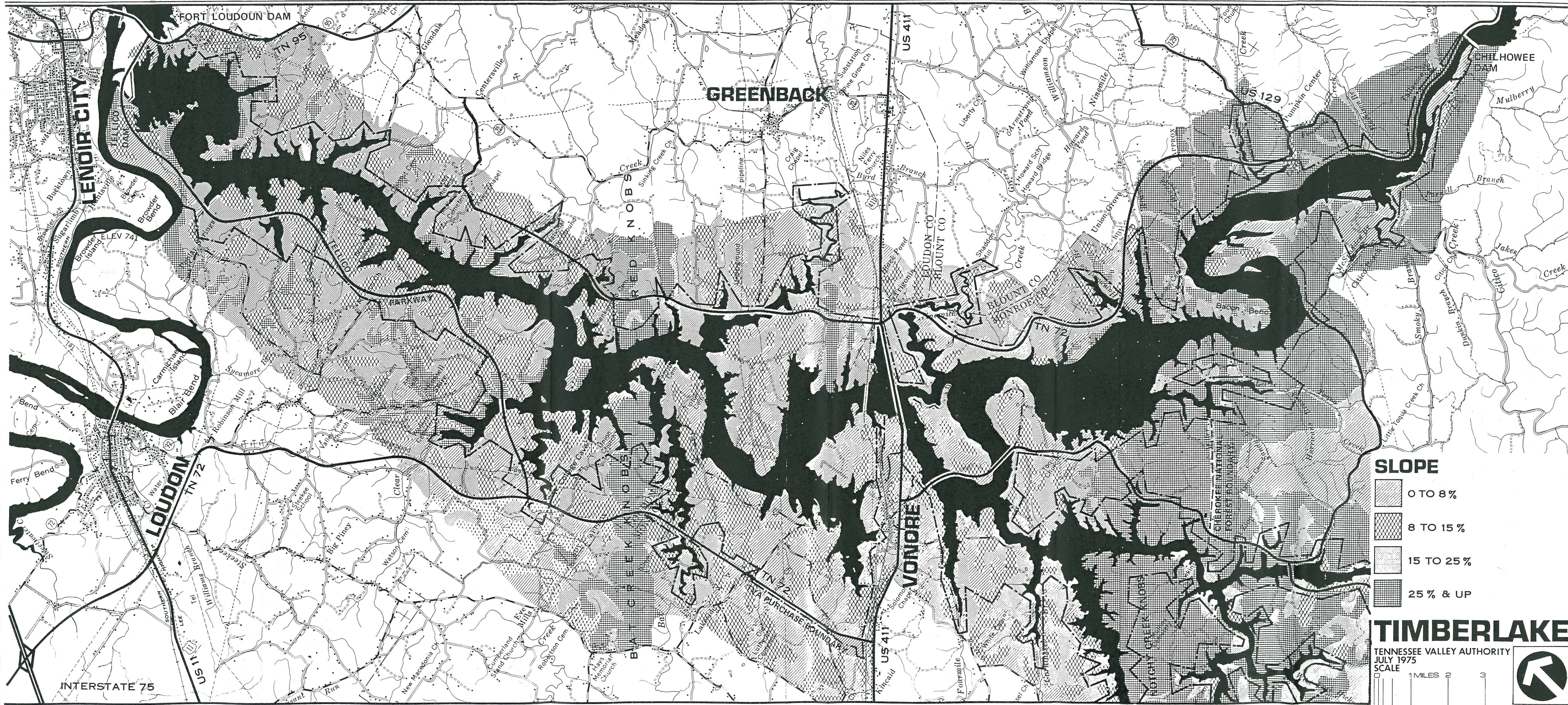
LEGEND

- RESIDENTIAL**
- PERMANENT / SEASONAL
 - LOW DENSITY
 - HIGH DENSITY
- SEASONAL / PERMANENT
 - LOW DENSITY
 - HIGH DENSITY
 - REMOTE (LOW DENSITY)
- COMMERCIAL**
- TOWN CENTER
- VILLAGE CENTER
- INDUSTRIAL**
- MAJOR
- LIGHT
- INSTITUTIONAL**
- HUMAN RESOURCE PARK
- ELEMENTARY SCHOOL
- INTERPRETIVE CENTER
- PUBLIC BARGE TERMINAL
 - PRIMARY
 - SECONDARY
- SAFETY HARBOR
- WATER PLANT
- SEWAGE TREATMENT PLANT
- RECREATION**
- PUBLIC RECREATION
- COMMERCIAL RECREATION
- PUBLIC RECREATION / COMMERCIAL RECREATION
- MARINA**
- PRIMARY
- SECONDARY
- PUBLIC USE AREA
- WATER DESTINATION FACILITY
- DAM RESERVATION
- HISTORIC SITE
- MAJOR OPEN SPACE
- TRANSPORTATION**
- HIGHWAY
- RAILROAD
- PEDESTRIAN / BIKE TRAIL
- PROPOSED BRIDGE / ROAD

**TIMBERLAKE
LAND USE PLAN**





TENNESSEE VALLEY AUTHORITY
JULY 1975
SCALE





GREENBACK

SLOPE

-  0 TO 8%
-  8 TO 15%
-  15 TO 25%
-  25% & UP

TIMBERLAKE

TENNESSEE VALLEY AUTHORITY
 JULY 1975
 SCALE



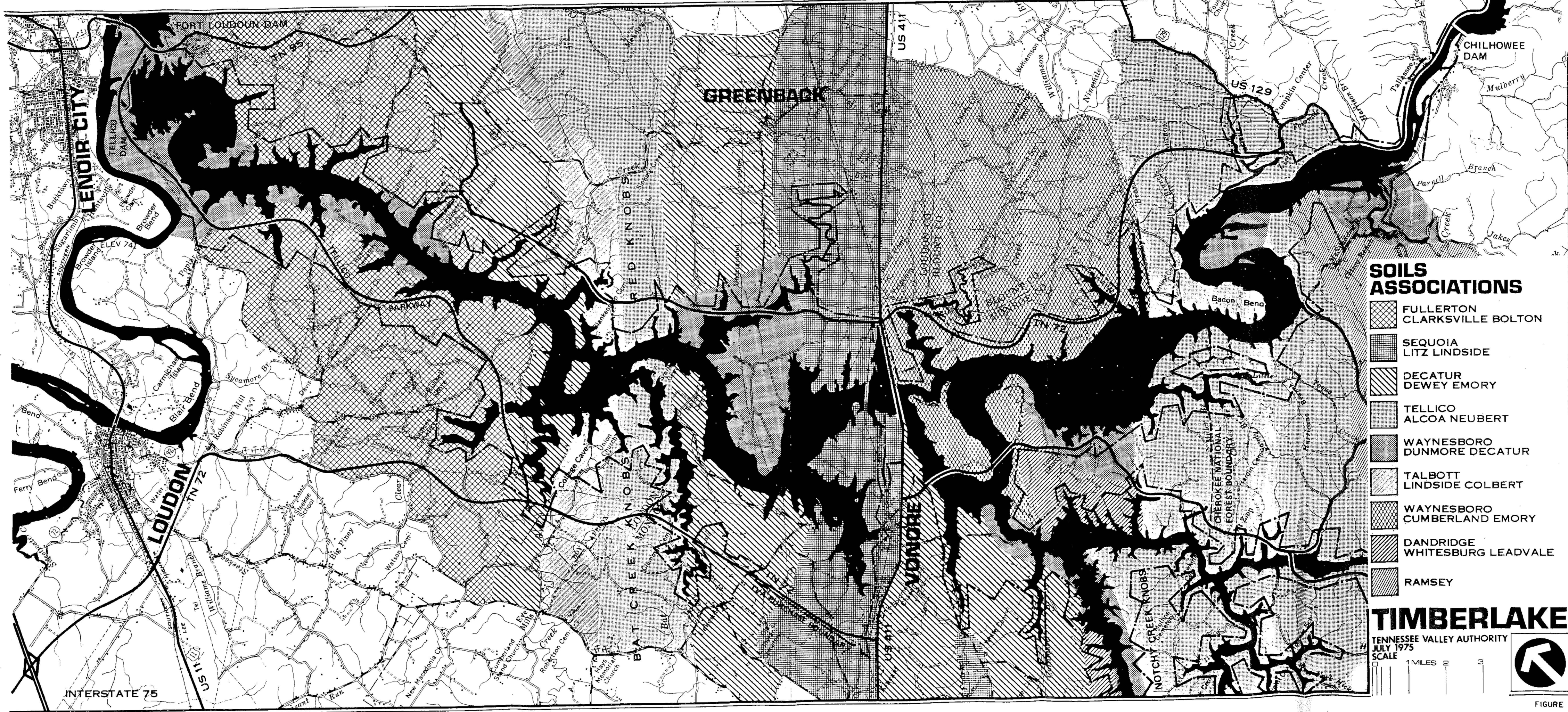
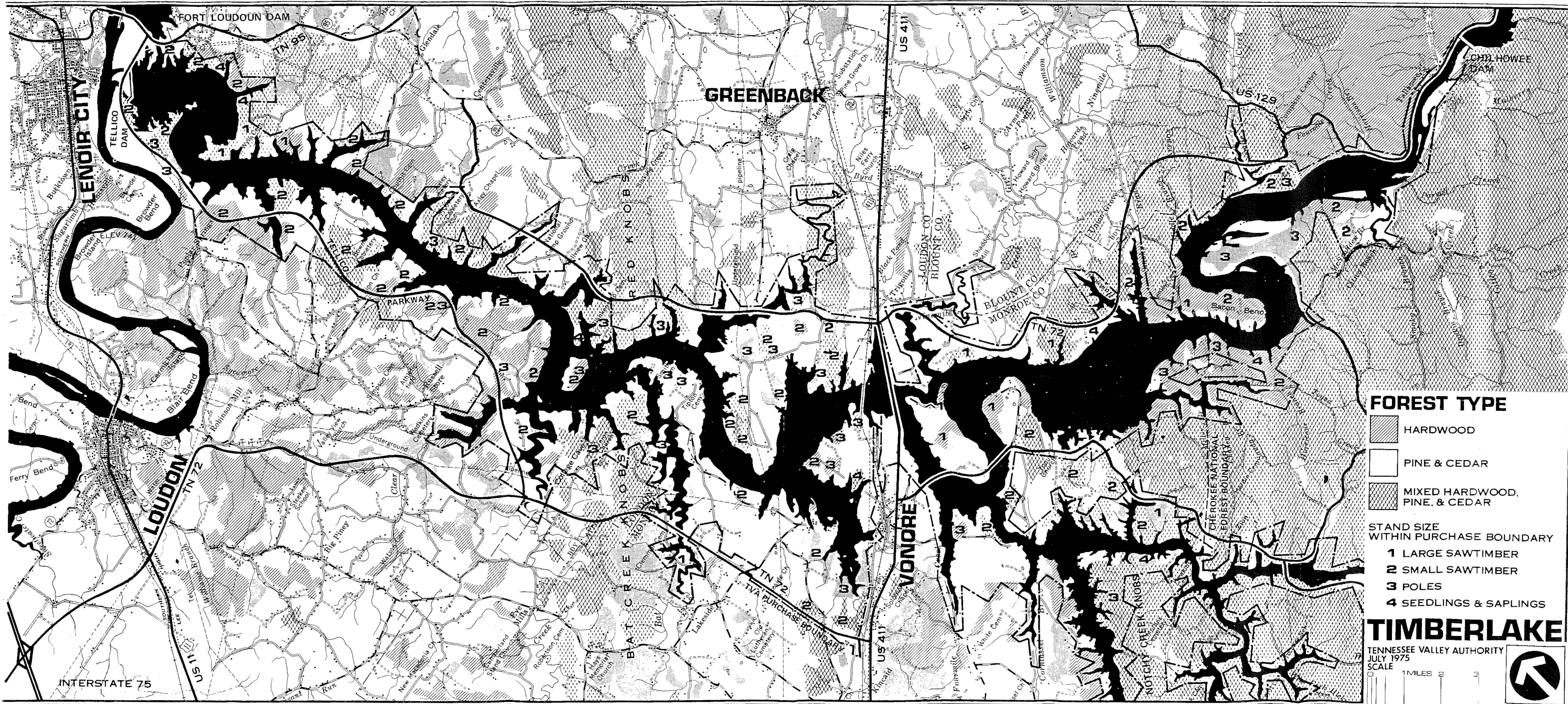





FIGURE 7



FOREST TYPE

-  HARDWOOD
-  PINE & CEDAR
-  MIXED HARDWOOD, PINE, & CEDAR

STAND SIZE WITHIN PURCHASE BOUNDARY

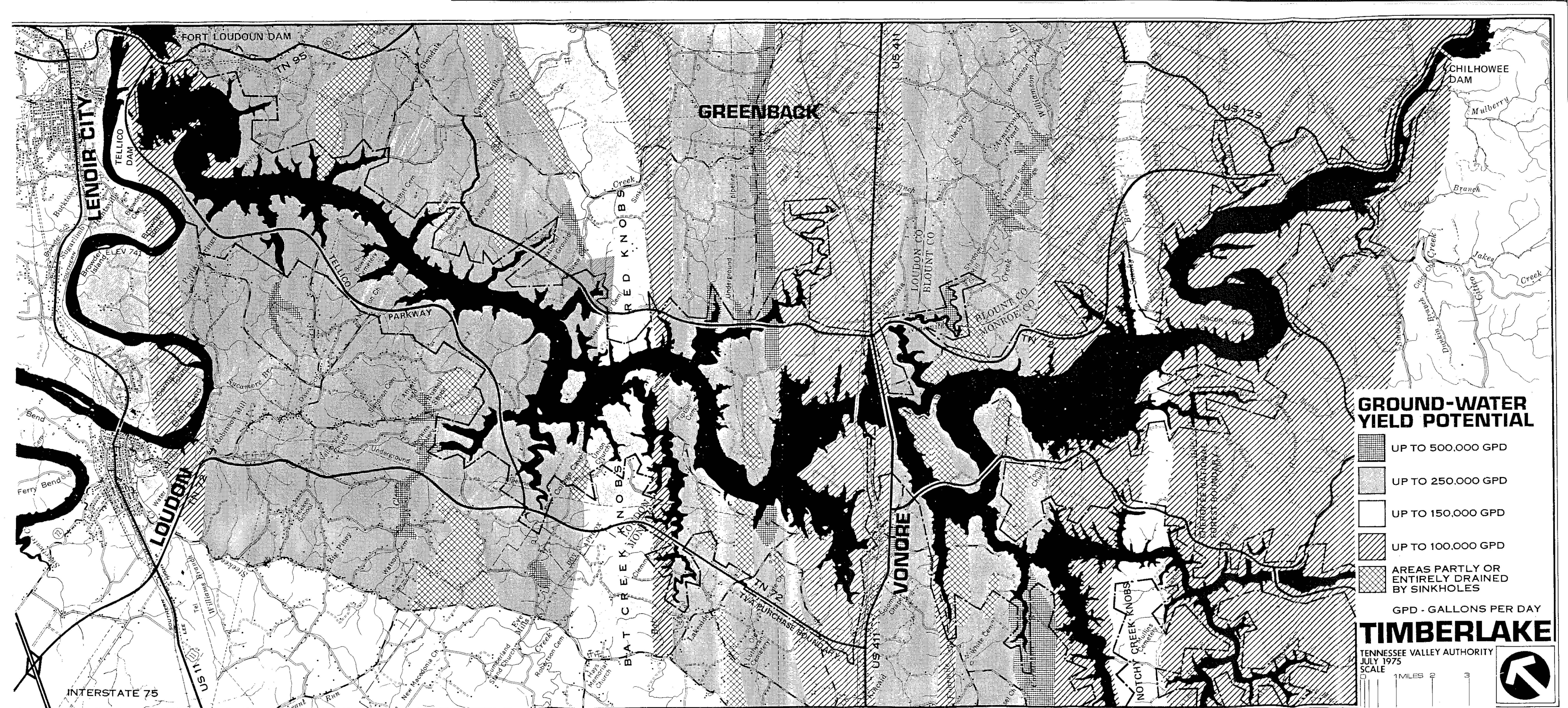
- 1** LARGE SAWTIMBER
- 2** SMALL SAWTIMBER
- 3** POLES
- 4** SEEDLINGS & SAPLINGS

TIMBERLAKE






TENNESSEE VALLEY AUTHORITY
 JULY 1975
 SCALE



FIGURE



GROUND-WATER YIELD POTENTIAL

-  UP TO 500,000 GPD
-  UP TO 250,000 GPD
-  UP TO 150,000 GPD
-  UP TO 100,000 GPD
-  AREAS PARTLY OR ENTIRELY DRAINED BY SINKHOLES

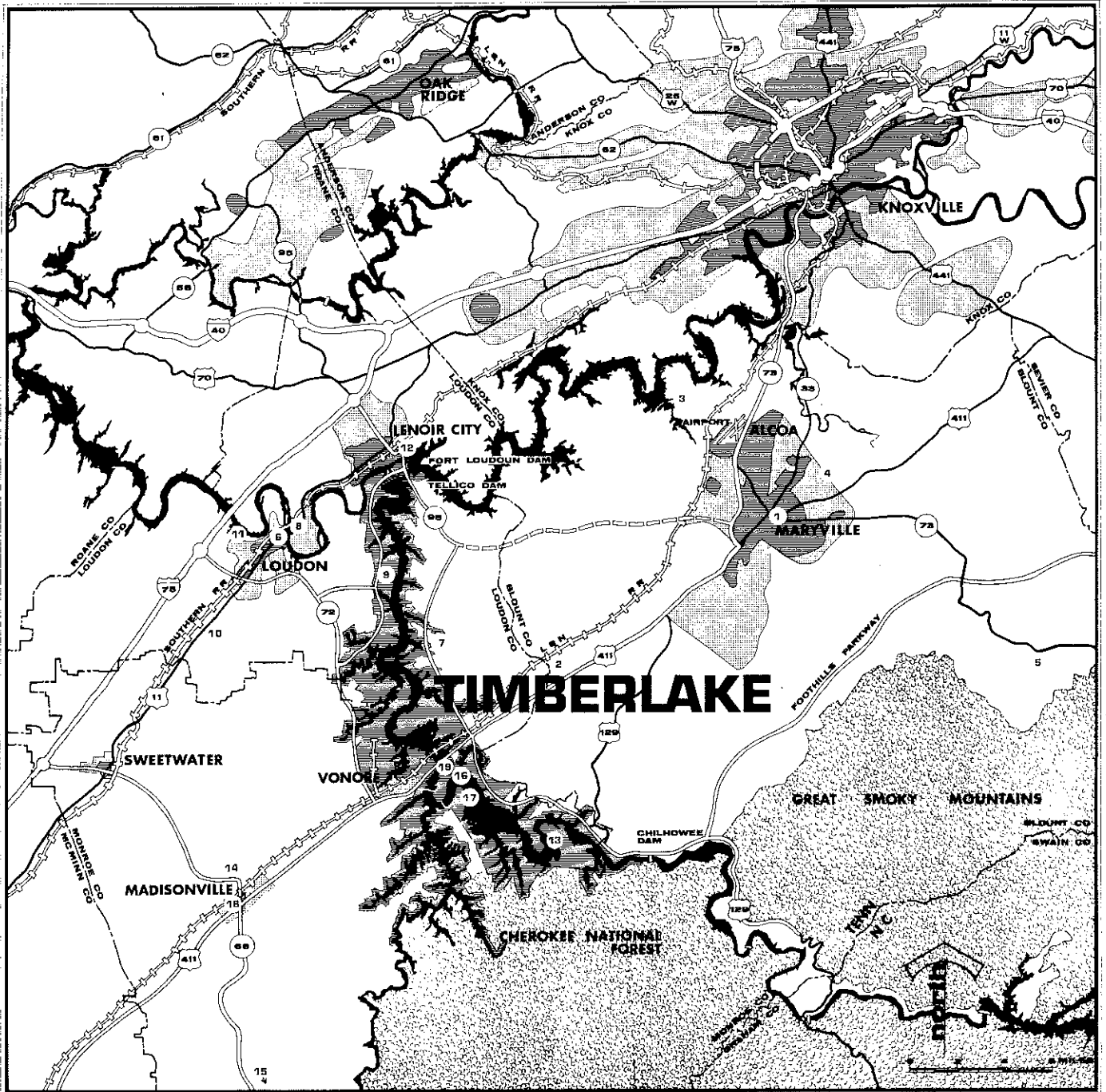
GPD - GALLONS PER DAY

TIMBERLAKE

TENNESSEE VALLEY AUTHORITY
 JULY 1975
 SCALE



FIGURE 9



NATIONAL REGISTER OF HISTORIC PLACES

Blount County

1. Anderson and Memorial Halls
2. Henry House
3. Louisville Historic District
4. Sam Houston Schoolhouse
5. Little River Lumber Company Office

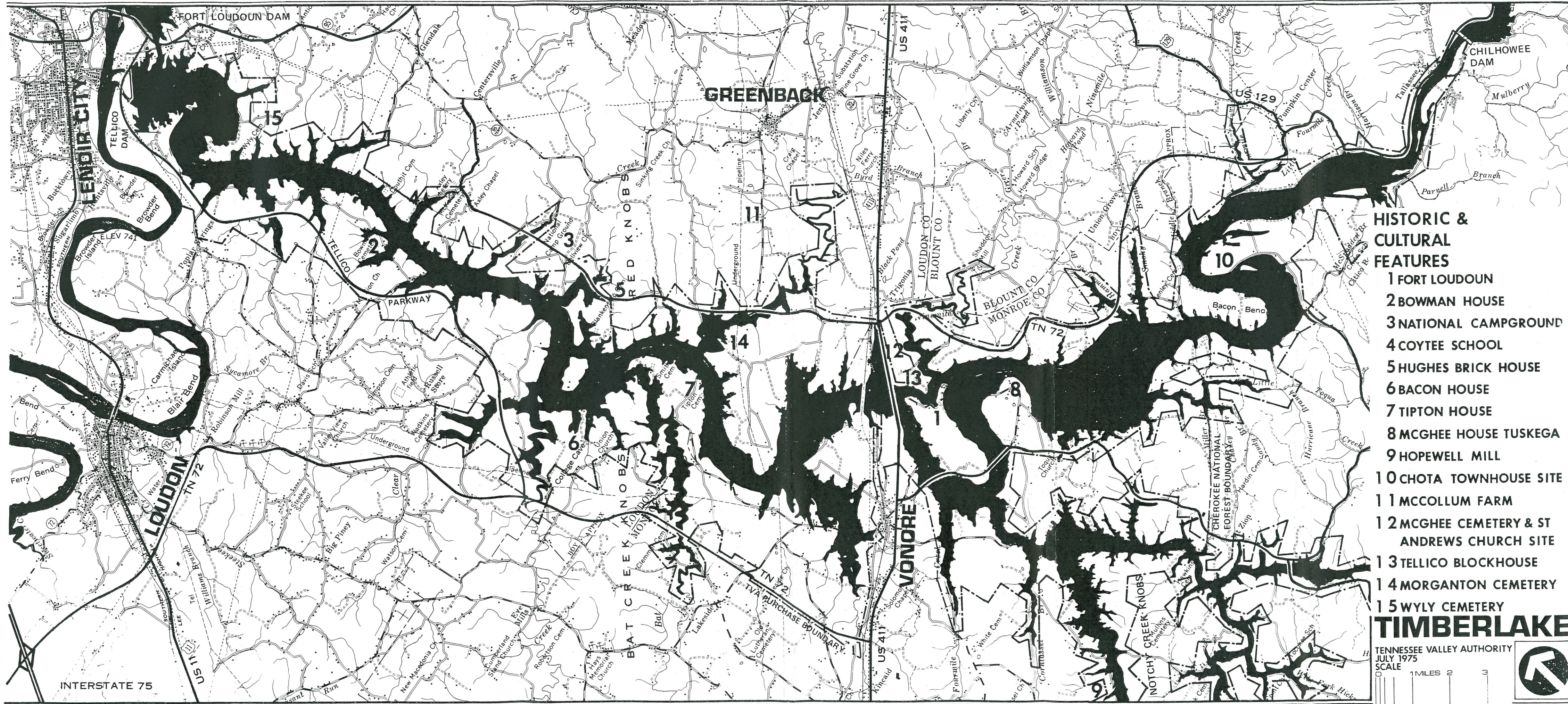
Loudon County

6. Courthouse
7. National Campground
8. Carmichael Inn
9. Bowman House
10. Cannon/Calloway House
11. Albert S. Lenoir House
12. Lenoir Cotton Mill

Monroe County

13. Chota – Tanassee Village Sites
14. Cook-Kefauver House
15. Elisha Johnson Mansion
16. Fort Loudoun
17. McGhee House
18. Stickley House
19. Tellico Blockhouse Site

FIGURE 11



- HISTORIC & CULTURAL FEATURES**
- 1 FORT LOUDOUN
 - 2 BOWMAN HOUSE
 - 3 NATIONAL CAMPGROUND
 - 4 COYTEE SCHOOL
 - 5 HUGHES BRICK HOUSE
 - 6 BACON HOUSE
 - 7 TIPTON HOUSE
 - 8 MCGHEE HOUSE TUSKEGA
 - 9 HOPEWELL MILL
 - 10 CHOTA TOWNHOUSE SITE
 - 11 MCCOLLUM FARM
 - 12 MCGHEE CEMETERY & ST ANDREWS CHURCH SITE
 - 13 TELLICO BLOCKHOUSE
 - 14 MORGANTON CEMETERY
 - 15 WYLY CEMETERY

TIMBERLAKE
 TENNESSEE VALLEY AUTHORITY
 JULY 1975
 SCALE
 0 1 MILES 2 3

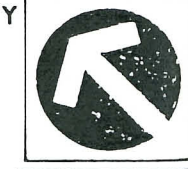
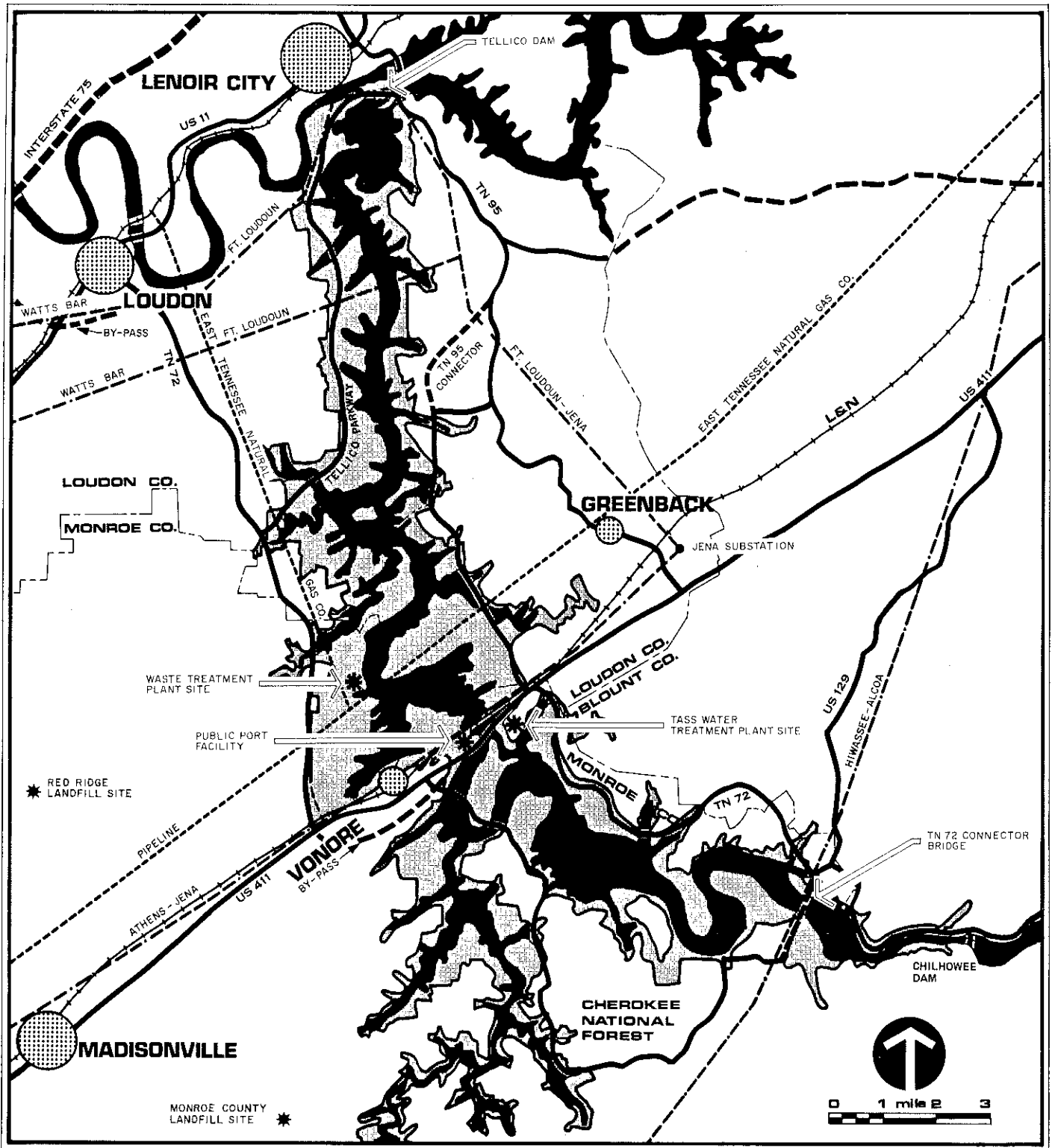
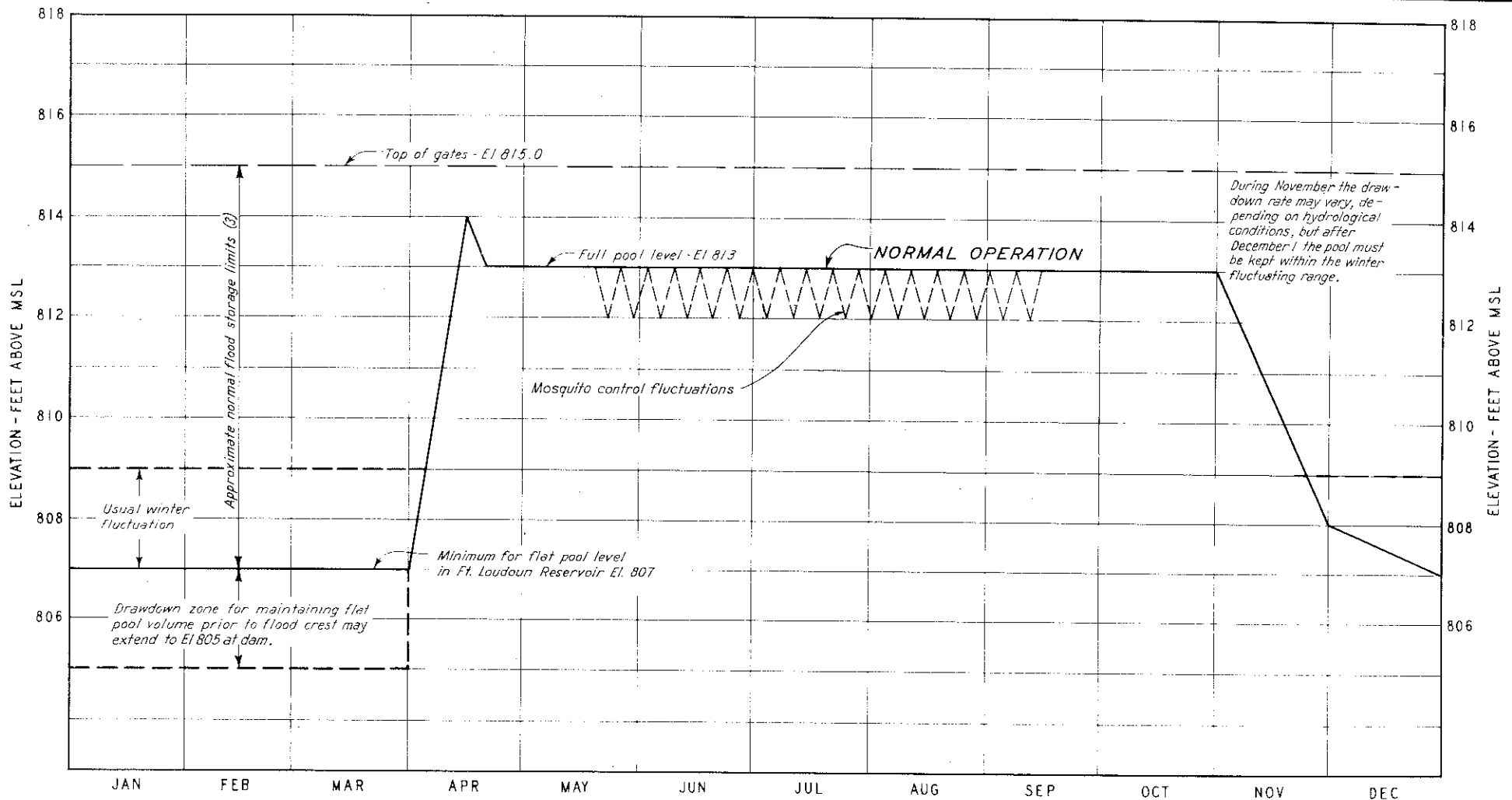


FIGURE 10



EXISTING & PLANNED AREA INFRASTRUCTURE

FIGURE 13



NOTES:

- (1) Elevations apply only at dam.
- (2) Maximum level assumed for design of dam - El 817.5.
- (3) Under extreme flood conditions the reservoir may be surcharged as high as El. 817.5.

J	2-16-67	RHL	REM		
Maximum drawdown revised					
REV NO.	DATE	MADE	CHKD	SUPY	INSP
DRWN	COMPUTED				
TRCD	ENGINEER				
CHKD	J. S. Roper				

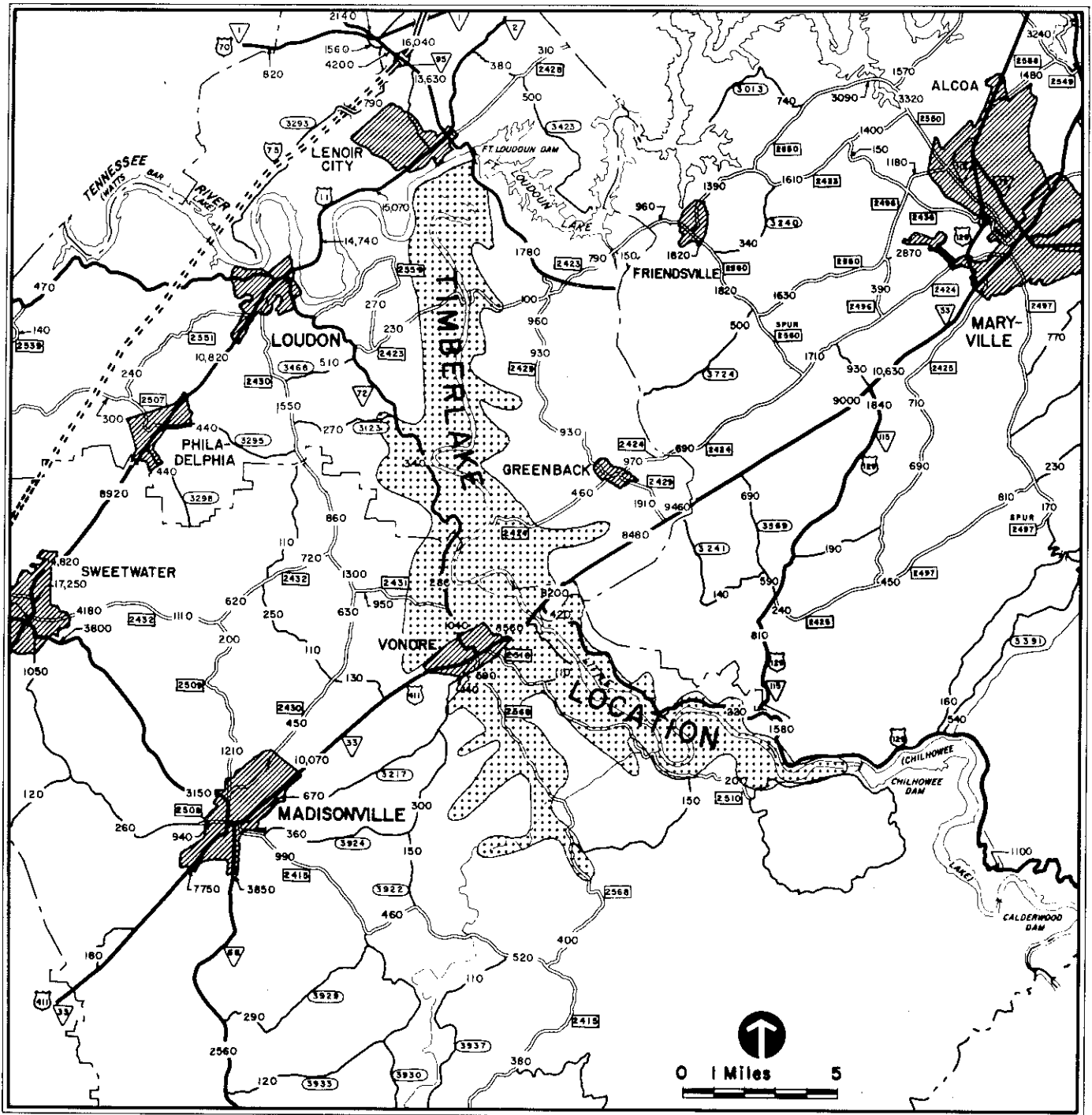
MULTIPLE - PURPOSE RESERVOIR OPERATIONS

TELLICO PROJECT
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING




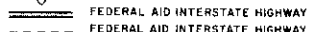
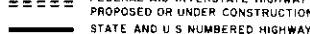
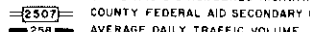
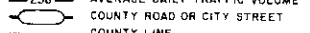
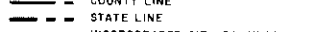
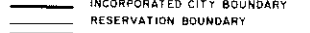
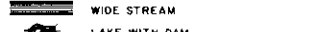
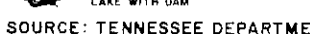




SUBMITTED	RECOMMENDED	APPROVED
Wm. E. Looze	Don H. Matton	R. A. Zeeb
KNOXVILLE	4-29-60	IOA PP I 321G758RI

RECOMMENDED: L. R. E.

FIGURE 14

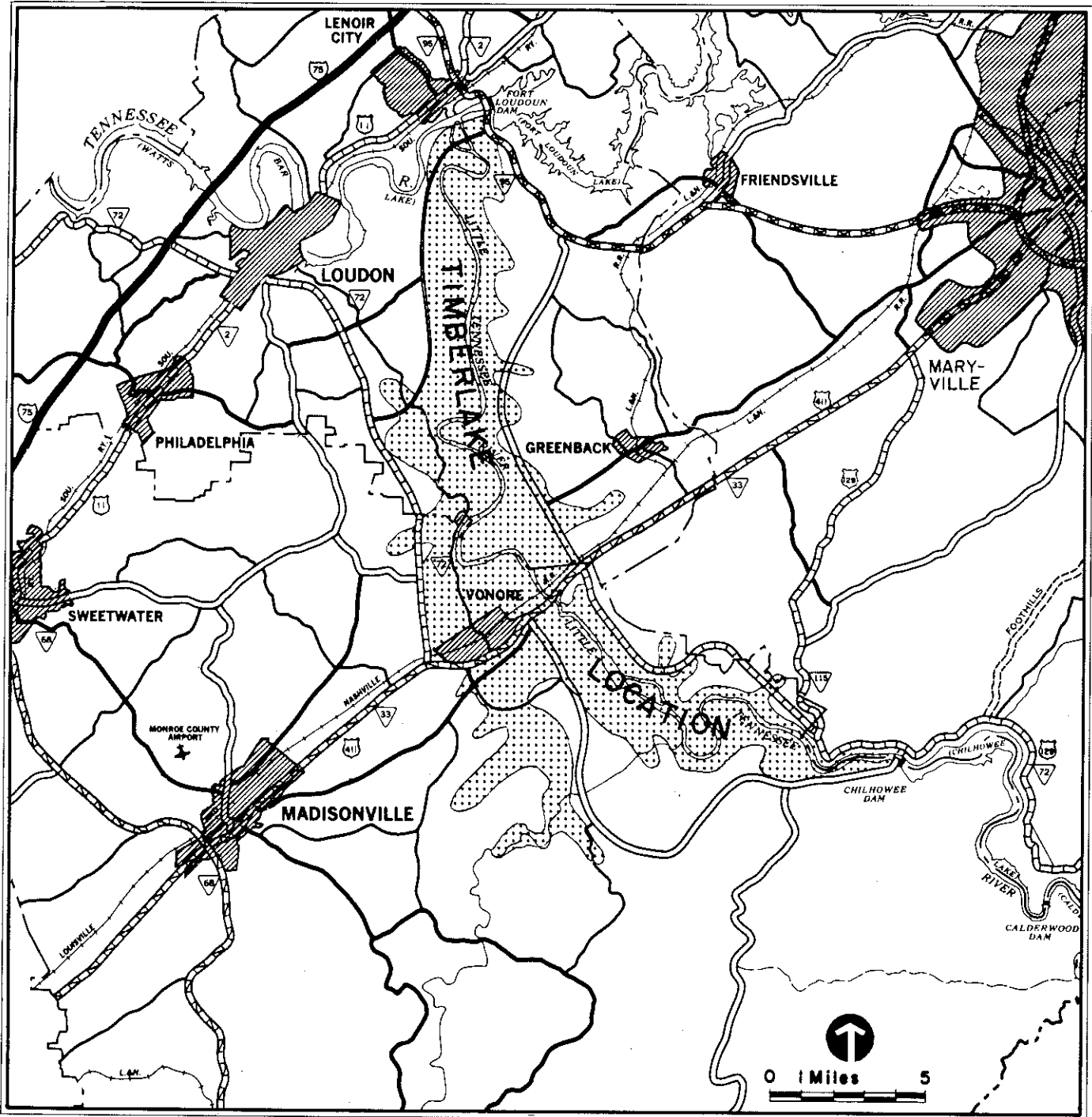


TRAFFIC COUNTS - 1972




















-  INTERSTATE HIGHWAY MARKER
-  U.S. NUMBERED HIGHWAY MARKER
-  STATE HIGHWAY MARKER
-  FEDERAL AID INTERSTATE HIGHWAY
-  FEDERAL AID INTERSTATE HIGHWAY PROPOSED OR UNDER CONSTRUCTION
-  STATE AND U.S. NUMBERED HIGHWAY
-  COUNTY FEDERAL AID SECONDARY HIGHWAY
-  AVERAGE DAILY TRAFFIC VOLUME
-  COUNTY ROAD OR CITY STREET
-  COUNTY LINE
-  STATE LINE
-  INCORPORATED CITY BOUNDARY
-  RESERVATION BOUNDARY
-  WIDE STREAM
-  LAKE WITH DAM

SOURCE: TENNESSEE DEPARTMENT OF HIGHWAYS

FIGURE 15.

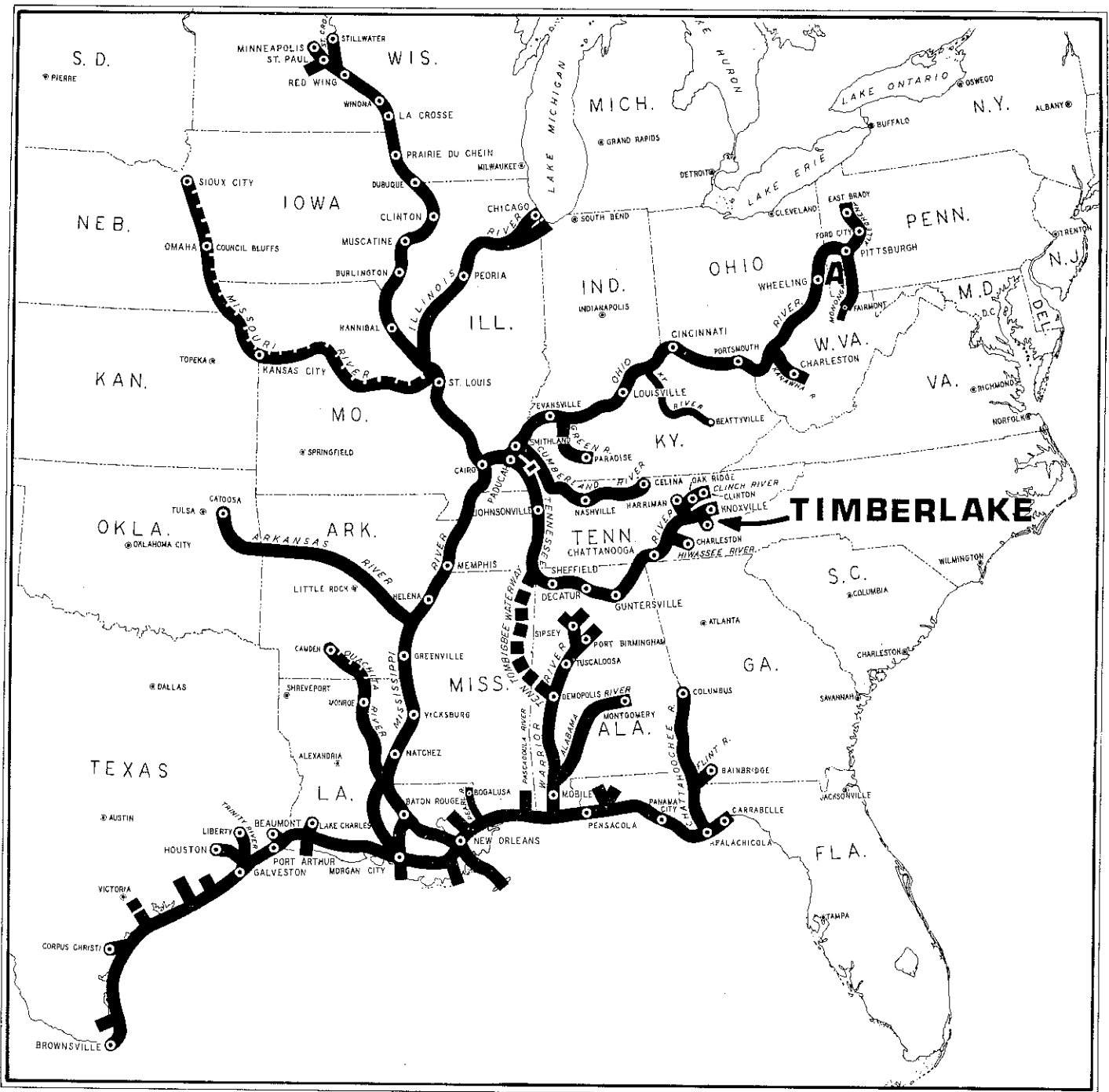


HIGHWAY PLAN - 1990

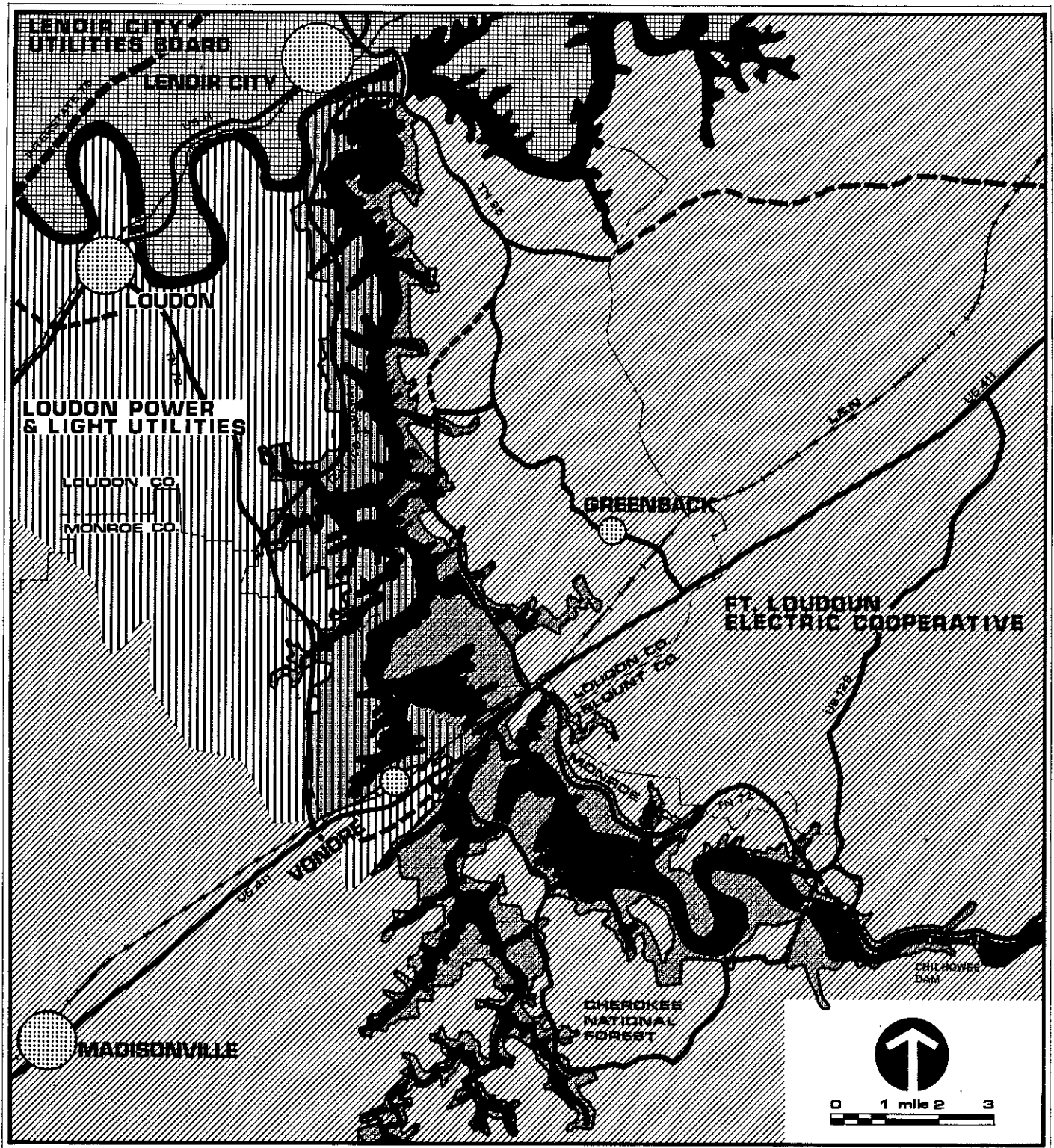
-  INTERSTATE HIGHWAY MARKER
-  STATE HIGHWAY MARKER
-  INTERSTATE
-  OTHER FREEWAY
-  PRINCIPAL ARTERIAL
-  MAJOR ARTERIAL
-  MINOR ARTERIAL
-  STATE PRINCIPAL COLLECTOR
-  LOCAL PRINCIPAL COLLECTOR
-  FEDERAL PARKWAY
-  LOCAL MAJOR COLLECTOR
-  LOCAL MINOR COLLECTOR
-  RAILROAD
-  STATE LINE
-  COUNTY LINE
-  INCORPORATED CITY BOUNDARY
-  RESERVATION BOUNDARY
-  PROJECTED 1990 URBAN BOUNDARY
-  WIDE STREAM

SOURCE: TENNESSEE DEPARTMENT OF HIGHWAYS

FIGURE 16



TENNESSEE RIVER AND INTERCONNECTED INLAND WATERWAY SYSTEM



RURAL ELECTRIC SERVICE AREAS

FIGURE 18

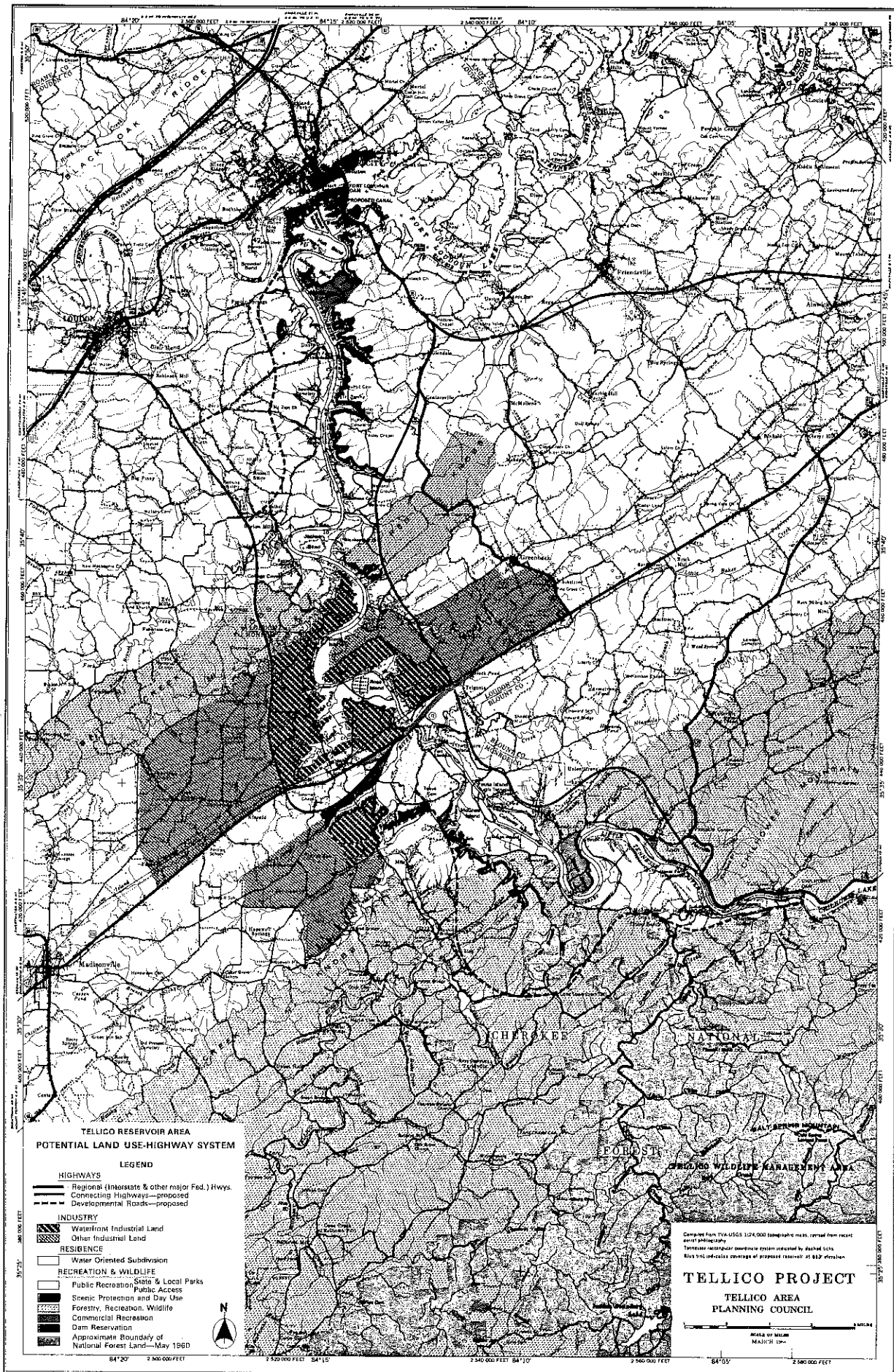
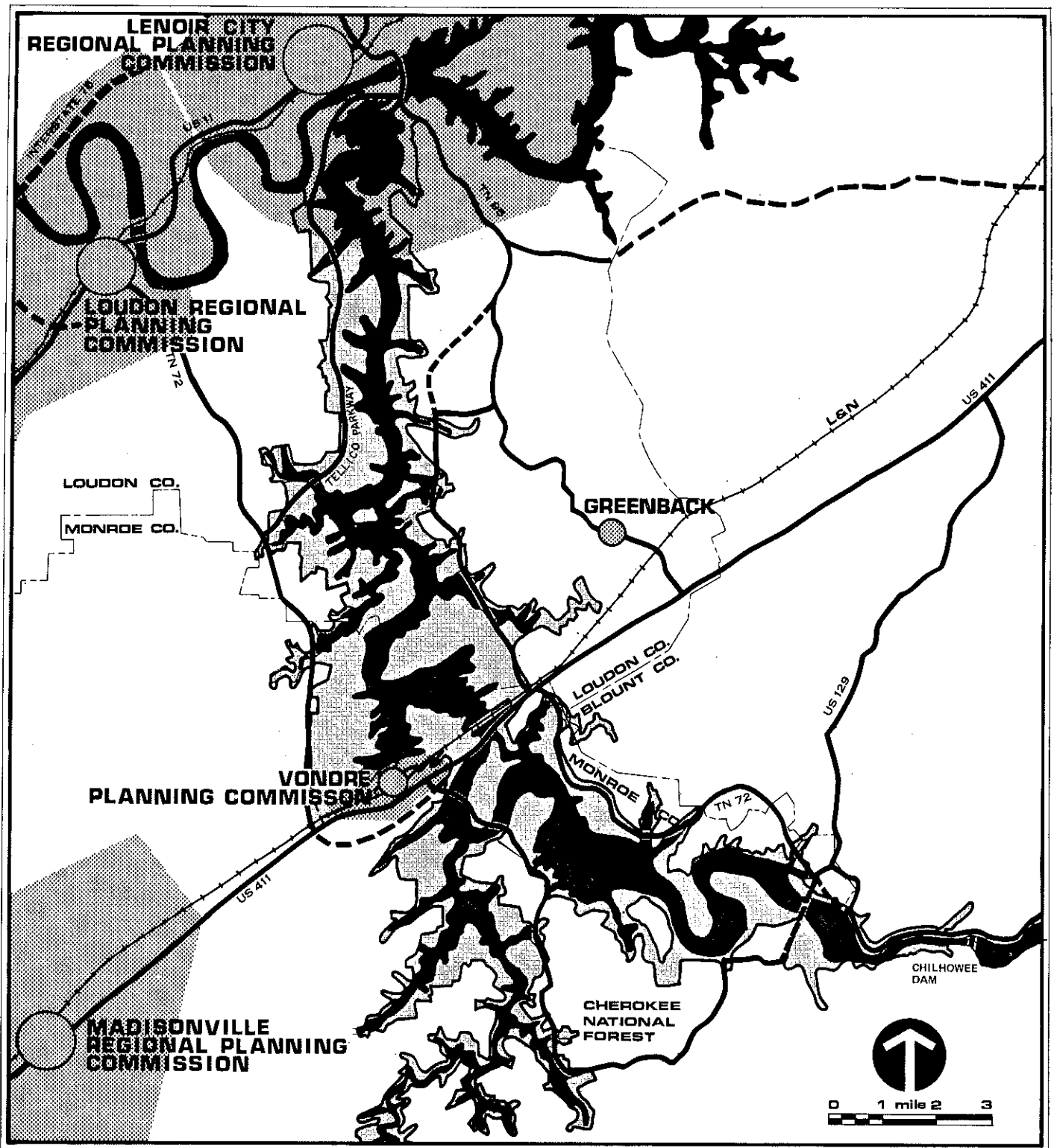


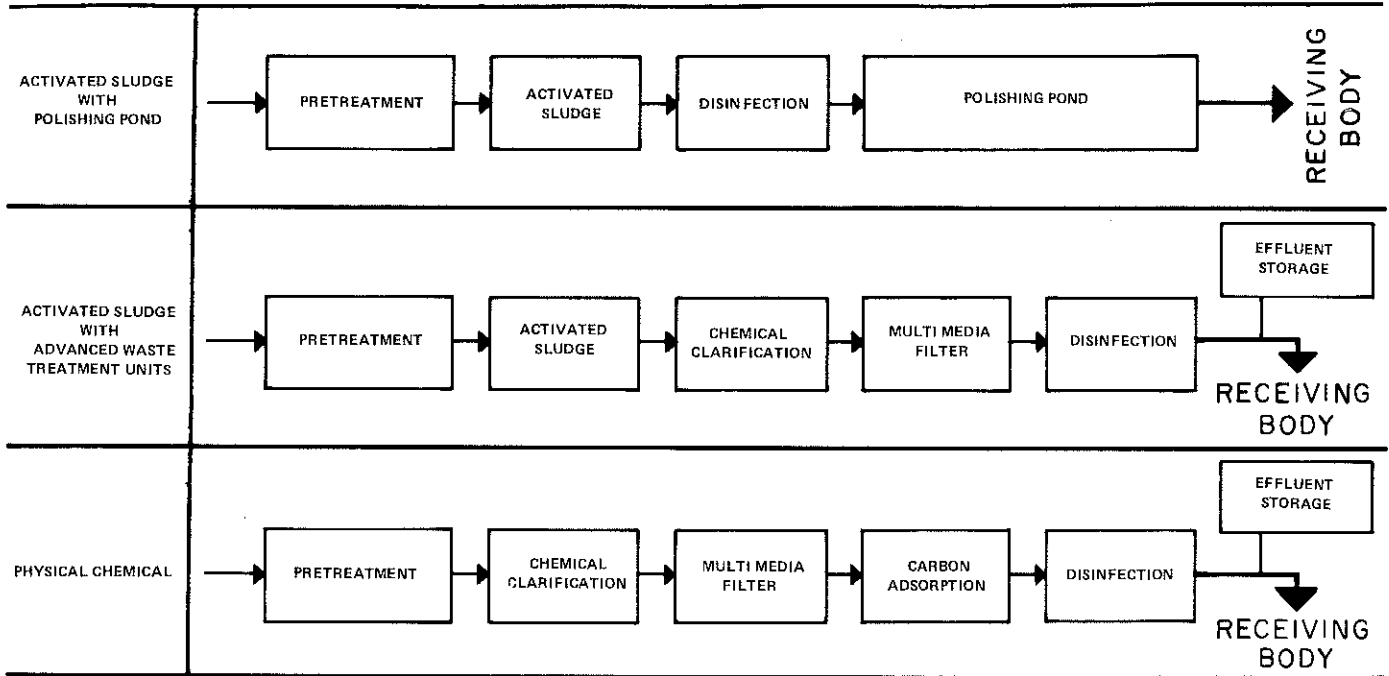
FIGURE 19



PLANNING JURISDICTIONS

-  MUNICIPAL
-  COUNTY REGIONAL PLANNING COMMISSION
-  TIMBERLAKE

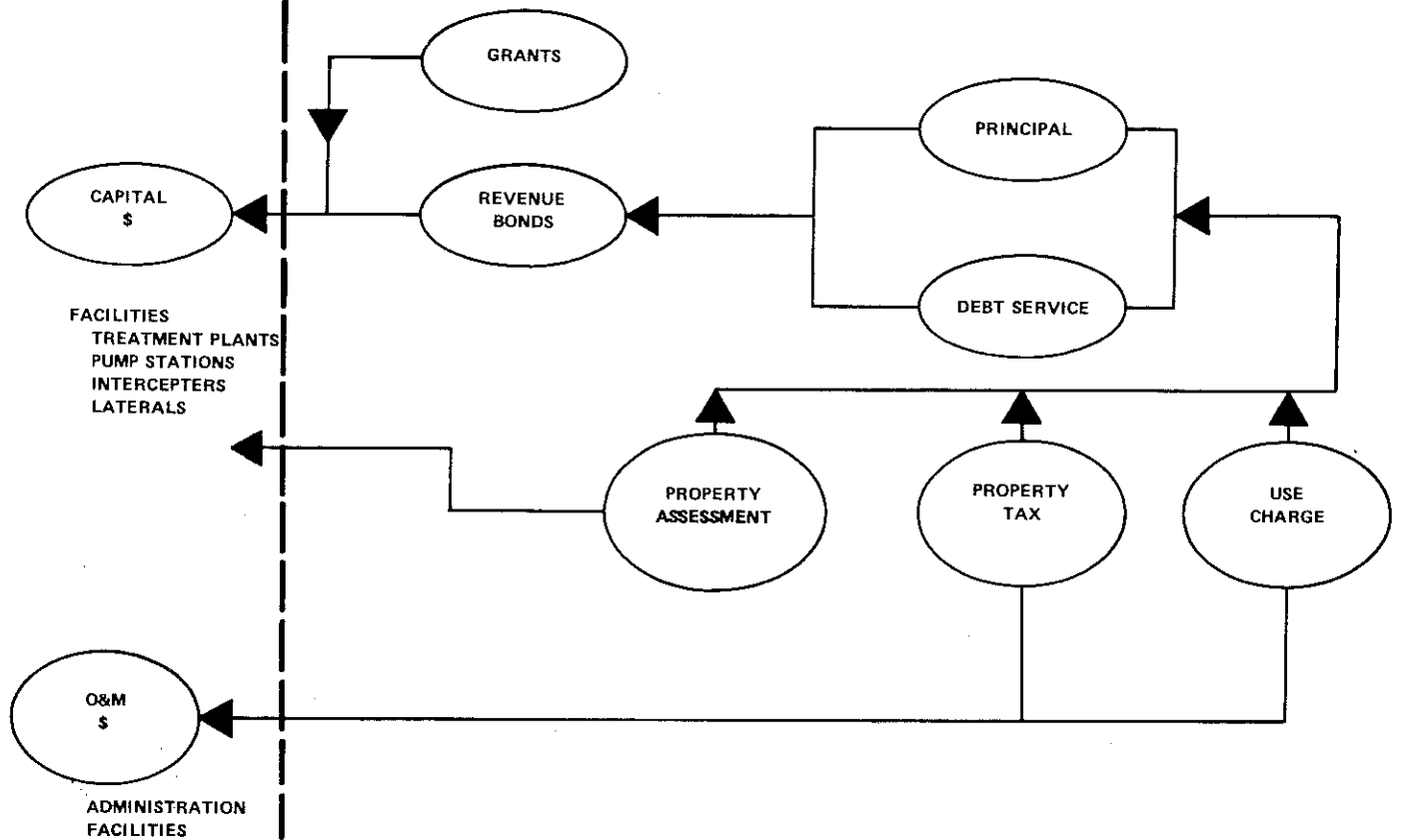
FIGURE 20



WASTEWATER TREATMENT SYSTEMS FLOWS

FUNDS REQUIRED

FUNDING SOURCES



WASTEWATER SYSTEM FUNDING

APPENDIX B

Table 1
Summary of Projected Timberlake Development Program

Item	PHASE I (1976-1980) Range		PHASE II (1981-1985) Range		PHASE III (1986-1990) Range		PHASE IV (1991-1995) Range		PROGRAM TOTAL Range	
	Low	High	Low	High	Low	High	Low	High	Low	High
Acreage Absorption (Developed)	2,900	3,400	2,500	2,900	2,600	3,000	2,600	3,300	10,600	12,600
Dwelling Units										
Year-round	1,000	1,200	1,800	2,300	2,400	3,100	3,300	4,400	8,500	11,000
Seasonal	500	600	1,700	1,800	1,700	1,800	1,600	1,700	5,500	5,900
Residential Population	2,900	3,500	5,000	6,000	6,700	8,500	9,000	12,000	23,500	30,000
Employment	1,500	2,200	2,300	3,500	2,600	3,600	2,800	4,300	9,200	13,600
Neighborhood/Community Commercial and Activity Centers	3	3	2	2	5	5	4	4	14	14

Source: Division of Navigation Development and Regional Studies, TVA.

Table 4
Soil Limitations

Soil Name	Building Construction Footings and Foundations		Landscaping Lawns and Ornamental	Sanitary Facilities Septic Tanks (2-15% slope)	Transportation Hwys. and Paved Parking (2-15% slope)	Recreation Development (2-15% slope)	Notes
	Dwellings (2-15% slope)	Light MFG (2-8% slope)					
Alcoa	Moderate	Moderate	Slight-Moderate	Slight-Moderate	Moderate	Slight-Moderate	
Boiton	Slight-Moderate	Slight-Moderate	Slight-Moderate	Moderate	Moderate	Moderate	
Clarksville	Moderate	Moderate	Moderate-Severe	Slight	Moderate	Slight-Moderate	
Colbert	Severe	Severe	Slight-Moderate	Severe	Severe	Moderate-Severe	Rock
Cumberland	Moderate	Moderate	Slight-Moderate	Slight-Moderate	Moderate	Slight-Moderate	
Dandridge	-	-	Moderate-Severe	-	-	-	15%-50% Slope
Decatur	Moderate	Moderate	Slight-Moderate	Moderate	Moderate	Slight-Moderate	
Dewey	Moderate	Moderate	Moderate	Slight-Moderate	Moderate-Severe	Slight-Moderate	Areas pitted with limestone sinks
Dunmore	Moderate	Moderate	Slight-Moderate	Moderate	Moderate	Slight-Moderate	Areas pitted with limestone sinks
Emory	Moderate	Moderate	Slight-Moderate	Slight-Moderate	Moderate	Slight	Rankings are for nonflooded areas
Fullerton	Slight-Moderate	Slight-Moderate	Slight-Moderate	Moderate	Moderate	Moderate	
Leadvale	Moderate	Moderate	Slight-Moderate	Severe	Moderate	Slight-Moderate	
Lindsay	Severe	Severe	Slight-Moderate	Severe	Severe	Moderate-Severe	Subject to flooding
Litz	Severe(Rock)	-	Severe	Severe	Severe	Severe	12-25% slope
Neubert	Slight-Severe	Slight-Severe	Slight	Slight-Severe	Moderate	Slight-Severe	Rare flooding, slides from adjacent steep slopes
Ramsey	Severe	-	Moderate-Severe	Severe	Severe	Moderate	10-70% slope
Sequoia	Moderate	Moderate	Slight-Moderate	Severe	Severe	Slight-Moderate	
Talbott	Moderate	Moderate	Slight-Moderate	Severe	Moderate-Severe	Moderate	
Telllico	Moderate	Moderate	Slight-Moderate	Slight-Moderate	Moderate	Moderate	20-60% slope—Most
Waynesboro	Moderate	Moderate	Slight-Moderate	Slight-Moderate	Moderate-Severe	Slight-Moderate	3-20% slope—Some
Whitesburg	Severe	Severe	Moderate	Severe	Moderate-Severe	Moderate	Seasonal high water table is limiting factor

Slight Soils have properties favorable for the rated use. Limitations are so minor that they can be easily overcome. Good performance and low maintenance can be expected from these soils.

Moderate Soils have properties moderately favorable for the rated use. Limitations can be overcome or modified with planning, design, or special maintenance.

Severe Soils have one or more properties unfavorable for the rated use. Limitations are difficult and costly to modify or overcome, requiring major soil reclamation, special design, or intense maintenance.

Source: Division of Navigation Development and Regional Studies, TVA, based on Soil Conservation Service published reports and TVA Soils information.

Table 5

List of Tree Species
Found in the Timberlake Area

<u>Common Name</u>	<u>Scientific Name</u>
Loblolly pine	<i>Pinus taeda</i>
Pitch pine	<i>Pinus rigida</i>
Shortleaf pine	<i>Pinus echinata</i>
Table mountain pine	<i>Pinus pungens</i>
Virginia pine	<i>Pinus virginiana</i>
White pine	<i>Pinus strobus</i>
Eastern red cedar	<i>Juniperus virginiana</i>
Eastern hemlock	<i>Tsuga canadensis</i>
Black oak	<i>Quercus velutina</i>
Northern red oak	<i>Quercus rubra</i>
Southern red oak	<i>Quercus falcata</i>
Blackjack oak	<i>Quercus marilandica</i>
Scarlet oak	<i>Quercus coccinea</i>
Willow oak	<i>Quercus phellos</i>
Chestnut oak	<i>Quercus prinus</i>
Chinquapin oak	<i>Quercus muehlenbergii</i>
Swamp white oak	<i>Quercus bicolor</i>
White oak	<i>Quercus alba</i>
American basswood	<i>Tilia americana</i>
Yellow buckeye	<i>Aesculus octandra</i> sp.
Cucumber tree	<i>Magnolia acuminata</i>
Black gum	<i>Nyssa sylvatica</i>
Sweet gum	<i>Liquidambar styraciflua</i>
Magnolia	<i>Magnolia</i> sp.
Red maple	<i>Acer rubrum</i>
Yellow poplar	<i>Liriodendron tulipifera</i>
Ash	<i>Fraxinus</i> sp.
American beech	<i>Fagus grandifolia</i>
Yellow birch	<i>Betula alleghaniensis</i>
Black cherry	<i>Prunus serotina</i>
Flowering dogwood	<i>Cornus florida</i>
Elm	<i>Ulmus</i> sp.
Hickory	<i>Carya</i> sp.
Sugar maple	<i>Acer saccharum</i>
Common persimmon	<i>Diospyros virginiana</i>
Black walnut	<i>Juglans nigra</i>
River birch	<i>Betula nigra</i>
Sweet birch	<i>Betula lenta</i>
Hackberry	<i>Celtis occidentalis</i>
Carolina silverbell	<i>Halesia carolina</i>
Sourwood	<i>Oxydendrum arboreum</i>
Sycamore	<i>Platanus occidentalis</i>
Northern catalpa	<i>Catalpa speciosa</i>
Black locust	<i>Robinia pseudoacacia</i>
Honey locust	<i>Gleditsia triacanthos</i>
Red mulberry	<i>Morus rubra</i>
Sassafras	<i>Sassafras albidum</i>

Table 5 (Continued)

<u>Common Name</u>	<u>Scientific Name</u>
Black willow	<i>Salix nigra</i>
Boxelder	<i>Acer negundo</i>
Tree-of-Heaven	<i>Ailanthus altissima</i>
American hornbeam	<i>Carpinus caroliniana</i>
Ironwood	<i>Ostrya virginiana</i>
Royal paulownia	<i>Paulownia tomentosa</i>
Eastern redbud	<i>Cercis canadensis</i>
Striped maple	<i>Acer pensylvanicum</i>
Mimosa	<i>Albizia julibrissin</i>
Pawpaw	<i>Asimina triloba</i>
Stiff cornel dogwood	<i>Cornus stricta</i>
Coastal plains willow	<i>Salix caroliniana</i>

Source: TVA forest inventory sample plots in Blount, Loudon, and Monroe Counties, Tennessee: Division of Forestry, Fisheries, and Wildlife Development.

Table 6

**Estimated Fall Populations of Selected
Resident Game Animals on Timberlake Site**

<u>Animal</u>	<u>Acres of Habitat</u>	<u>Fall Population</u>
Deer	7,600	190
Fox	11,400	70
Opossum	7,600	190
Quail	5,500	1,100
Rabbit	5,500	2,700
Raccoon	7,600	150
Squirrel	7,600	5,100

Source: Division of Forestry, Fisheries, and Wildlife Development, TVA.

Table 7

A Partial List of Mammal Species
Occurring in the Timberlake Area

Black bear - <i>Ursus americanus</i> ^a	Eastern mole - <i>Scalopus aquaticus</i>
Whitetail deer - <i>Odocoileus virginianus</i>	Southern flying squirrel - <i>Glaucomys volans</i>
Wild boar - <i>Sus scrofa</i> ^a	Eastern Chipmunk - <i>Tamias striatus</i>
Bobwhite quail - <i>Colinus virginianus</i>	White-footed mouse - <i>Peromyscus leucopus</i>
Cottontail rabbit - <i>Sylvilagus floridanus</i>	Eastern harvest mouse - <i>Reithrodontomys humulis</i>
Fox squirrel - <i>Sciurus niger</i> ^a	Eastern meadow mouse - <i>Microtus pennsylvanicus</i>
Gray squirrel - <i>Sciurus carolinensis</i>	Pine mouse - <i>Pitymys pinetorum</i>
Opossum - <i>Didelphis virginiana</i>	Carolina shrew - <i>Sorex longirostris</i>
Raccoon - <i>Procyon lotor</i>	Little short-tailed shrew - <i>Cryptotis parva</i>
Red fox - <i>Vulpes fulva</i>	Short-tailed shrew - <i>Blarina brevicauda</i>
Bobcat - <i>Lynx rufus</i> ^a	Little brown bat - <i>Myotis lucifugus</i>
Gray fox - <i>Urocyon cinereoargenteus</i>	Silver-haired bat - <i>Lasionycteris noctivagans</i>
Mink - <i>Mustela vison</i>	Pipistrelle bat - <i>Pipistrellus subflavus</i>
Muskrat - <i>Ondatra zibethica</i>	House mouse - <i>Mus musculus</i>
Striped skunk - <i>Mephitis mephitis</i>	
Weasel - <i>Mustela frenata</i>	
Woodchuck - <i>Marmota monax</i>	

a. Occurs infrequently in the project area.

Source: Division of Forestry, Fisheries, and Wildlife Development, TVA.

<u>Common Name</u>
Bay-breasted warbler
Blackpoll warbler
Pine warbler
Prairie warbler
Palm warbler
Ovenbird
Northern waterthrush
Louisiana waterthrush
Common yellowthroat
Yellow-breasted chat
Kentucky warbler
Mourning warbler
Connecticut warbler
Hooded warbler
Wilson's warbler
Canada warbler
American redstart
House sparrow
Bobolink
Eastern meadowlark
Red-winged blackbird
Rusty blackbird
Common grackle
Brown-headed cowbird
Orchard oriole
Baltimore oriole
Scarlet tanager
Summer tanager
Rose-breasted grosbeak
Cardinal grosbeak
Evening grosbeak
Indigo bunting
Purple finch
Pine siskin
American goldfinch
Dickcissel
Rufous-sided towhee
Savannah sparrow
Grasshopper sparrow
Henslow's sparrow
LeConte's sparrow
Sharp-tailed sparrow
Vesper sparrow
Lark sparrow
Slate-colored junco
Bachman's sparrow
Chipping sparrow
Field sparrow
White-crowned sparrow
White-throated sparrow
Fox sparrow
Lincoln's sparrow
Swamp sparrow
Song sparrow

a. S = Summer; W = Winter
 b. Habitat and populations
 Source: Division of Forestry

Table 10 (continued)

<u>Common name</u>	<u>Scientific name</u>
White bass	<i>Morone chrysops</i>
Rock bass	<i>Ambloplites rupestris</i>
Spotted bass	<i>Micropterus punctulatus</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Redbreast sunfish	<i>Lepomis gibbosus</i>
Green sunfish	<i>Lepomis macrochirus</i>
Longear sunfish	<i>Lepomis longiears</i>
Bluegill	<i>Lepomis macrochirus</i>
White crappie	<i>Pomoxis annularis</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Greenside darter	<i>Etheostoma blennioides</i>
Redline darter ^a	<i>Etheostoma caeruleum</i>
Tennessee snubnose darter ^a	<i>Etheostoma caeruleum</i>
Speckled darter ^a	<i>Etheostoma caeruleum</i>
Snail darter	<i>Percina nebulosa</i>
Gilt darter ^a	<i>Percina nebulosa</i>
Dusky darter ^a	<i>Percina nebulosa</i>
Logperch	<i>Percina roanoke</i>
Blotchside logperch	<i>Percina roanoke</i>
Sauger	<i>Stizostedionion</i>
Walleye ^a	<i>Stizostedionion</i>
Freshwater drum	<i>Aplodinotus bledius</i>
Mottled sculpin ^a	<i>Cottus bairdii</i>
Banded sculpin	<i>Cottus bairdii</i>

a. Records supplied by Dr. David Etnier, University of Tennessee, were taken in TVA fish collections.

Source: Tellico Project Final Environmental Statement (TVA-Chattanooga, Tennessee, February 10, 1972); revised Fisheries, and Wildlife Development, TVA, November 1971

Table 10 (continued)

List of Fishes That May Occur in
Lower Little Tennessee River^b

<u>Common name</u>	<u>Scientific name</u>
Paddlefish	<i>Polyodon spathula</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Mountain shiner	<i>Notropis lirus</i>
Silver shiner	<i>Notropis photogenis</i>
Rosyface shiner	<i>Notropis rubellus</i>
Shorthead redhorse	<i>Moxostoma macrolepidotum</i>
River redhorse	<i>Moxostoma carinatum</i>
Blue catfish	<i>Ictalurus furcatus</i>
Mosquitofish	<i>Gambusia affinis</i>
Bluebreast darter	<i>Etheostoma camurum</i>
Spotted darter	<i>Etheostoma maculatum</i>
Banded darter	<i>Etheostoma zonale</i>
Dusttail darter	<i>Etheostoma (catanotus) sp.</i>
Tangerine darter	<i>Percina aurantiaca</i>

b. List furnished by Dr. David Etnier, University of Tennessee, who considers them "probables" but have not been collected to date.

Source: Tellico Project Final Environmental Statement - OHES - EIS-72-1 (TVA-Chattanooga, Tennessee, February 10, 1972); revised by Division of Forestry, Fisheries, and Wildlife Development, TVA, November 1975.

Table 11

**Average Monthly Temperature and Precipitation
in the Timberlake Area**

<u>Month</u>	<u>Temperature In Degrees Fahrenheit^a</u>	<u>Precipitation In Inches of Rainfall^b</u>
January	41	5.28
February	42	5.26
March	49	5.39
April	59	3.95
May	68	3.65
June	76	3.39
July	79	5.05
August	78	3.68
September	72	3.17
October	61	2.81
November	48	3.69
December	41	4.86
Total	59 (avg.)	50.18

a. Source: U.S. Department of Agriculture, Weather Bureau, *Climatic Summary of United States, Supplement for 1951 through 1960, No. 86-35* (Tenn.), Washington, D.C. 1965.

b. Source: U.S., Tennessee Valley Authority, Division of Water Control Planning, *Precipitation in Tennessee River Basin - Annual 1972* (Knoxville, Tennessee)

Table 12

Air Quality Data from Loudon Trend Station

<u>Pollutant</u>	<u>Units</u>	<u>No. of Samples</u>		<u>Maximum</u>		<u>Geometric Mean</u>	
		<u>1971</u>	<u>1972</u>	<u>1971</u>	<u>1972</u>	<u>1971</u>	<u>1972</u>
Suspended Particulates (24-hour samples)	ug/m ³	55	73	81.0	121.0	42.4	39.3
Settled Particulates (monthly samples)	tons/(mi ² -mo)	8	12	5.7	7.4	3.6	3.8
Sulfation (monthly samples)	mg SO ₃ /(100 cm ² -day)	8	12	0.165	0.309	0.042	0.118
Fluoridation (monthly samples)	ug F/(100 cm ² -day)	6	8	0.460	0.380	0.147	0.176

Source: Division of Environmental Planning, TVA.

Table 13

**Baseline Population and Employment
Projections of Three Counties
1975 through 1995^a**

<u>Item</u>	<u>County</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>
Population:						
	Blount	68,000	72,500	77,500	83,000	88,400
	Loudon	25,500	26,600	27,900	29,400	30,900
	Monroe	24,400	25,200	26,000	26,800	27,700
	Total	117,900	124,300	131,400	139,200	147,000
Employment:						
	Blount	25,000	26,900	29,000	31,200	33,400
	Loudon	9,900	10,500	11,000	11,600	12,200
	Monroe	8,600	9,000	9,300	9,600	10,100
	Total	43,500	46,400	49,300	52,400	55,700 ^b

- a. These projections are baseline in nature, which means that they are a best estimate of what can be expected to materialize if there are no policy or program changes of an unusual and unforeseen nature or magnitude in the factors which have been changing over time and which are expected to continue on course in the future. The county population projections were developed as a disaggregation of economic area projections prepared by the Bureau of Economic Analysis, U.S. Department of Commerce, and the Economic Research Service, U.S. Department of Agriculture (referred to jointly as OBERS). They were disaggregated by the Tennessee Social Sciences Advisory Committee, composed of representatives of The University of Tennessee, the Tennessee State Planning Office, development districts, and other interested, knowledgeable persons, with assistance from the Tennessee Valley Authority, the U.S. Army Corps of Engineers, and the U.S. Environmental Protection Agency. The county employment projections were prepared by the Tennessee Valley Authority; Economic Research Staff, based on the population projections and the OBERS employment projections for economic areas.
- b. Of the total 55,700 jobs projected for 1995, 20,700 are expected to be manufacturing jobs, 400 are agricultural jobs, 100 mining, and 34,500 other.

Table 14

**Net Migration by Age Groups
for the Three-Counties Area
1950-1960 and 1960-1970**

<u>Age at End of Decade</u>	Blount, Loudon, and Monroe Counties	
	<u>1950-1960^a</u>	(Preliminary) <u>1960-1970^b</u>
Under 15 years	-3,811	-258
15 to 29 years	-8,367	-6,220
30 to 44 years	-3,036	611
45 to 64 years	-683	1,305
65 years and over	378	926
Total (net)	-15,519	-3,636

a. Source: Bowles, Gladys K., and Tarver, James D., *Net Migration of the Population, 1950-60 by Age, Sex, and Color*, Vol 1, Part 4. Washington, D.C.: U.S. Department of Agriculture, 1965.

b. Source: Richard A. Engels, *Tennessee Population and Housing, 1950-70*, Part 2: Age, Sex and Migration (Knoxville, Tennessee: Center for Business and Economic Research, The University of Tennessee), February 1972.

Table 15

**Industry of Employed Persons in
Blount, Loudon and Monroe Counties, 1970**

	Blount		County Loudon		Monroe	
	Number of Employed Persons	Percent of Total Employment	Number of Employed Persons	Percent of Total Employment	Number of Employed Persons	Percent of Total Employment
Agriculture	454	2.0	395	4.2	760	9.3
Mining	129	0.6	17	.2	60	.7
Construction	1,766	7.6	745	7.9	636	7.8
Manufacturing	8,291	35.9	4,378	46.3	3,476	42.6
Transportation	622	2.7	177	1.9	115	1.4
Communications	265	1.1	78	.8	63	.8
Utilities and Sanitary Services	403	1.7	209	2.2	119	1.5
Wholesale Trade	774	3.4	143	1.5	164	2.0
Food and Drinking	1,170	5.1	448	4.7	249	3.1
Retail	2,258	9.8	768	8.1	756	9.3
Insurance, Real Estate, and Finance	663	2.9	244	2.6	140	1.7
Business and Repair Service	507	2.2	233	2.5	123	1.5
Personal Services	1,161	5.0	337	3.6	298	3.6
Entertainment and Recreation	97	0.4	29	.3	63	.8
Health	1,203	5.2	387	4.1	236	2.9
Education	1,971	8.5	400	4.2	544	6.7
Welfare	319	1.3	79	.8	93	1.1
Legal Eng. and Misc. Prof. Services	253	1.1	87	.9	89	1.1
Public Adm.	814	3.5	303	3.2	176	2.1
Total	23,120	100.0	9,457	100.0	8,160	100.0

Source: U.S. Bureau of the Census, *Census of Population, 1970 "General Social and Economic Characteristics, Tennessee* (Washington, United States Government Printing Office)

Table 16

**Employed Residents in the Three Counties
and the Percentage Change From 1960 to 1970
As Compared with 201-County Tennessee Valley Region
and the State of Tennessee**

County	Number of Employed Residents		Percentage Changes of Employed Residents
	1960	1970	
Blount	18,198	23,188	27.4
Loudon	8,124	9,465	16.5
Monroe	7,180	8,170	13.8
Tennessee Valley Region	-	-	18.7
State of Tennessee	-	-	19.0

Source: Division of Navigation Development and Regional Studies, TVA, based on data from: U.S. Bureau of the Census, *Census of Population, 1960 and 1970, "General Social and Economic Characteristics," Tennessee* (Washington: United States Government Printing Office)

Table 17

**Unemployment Rates - Three Counties,
Knoxville SMSA, Tennessee, and the United States**

	1965	1970	1973	1974 ^a	June ^a 1975
Knoxville SMSA ^b	3.0	3.3	2.8	4.1	7.3
	n.a.				
Blount County (not available)	n.a.	n.a.	n.a.	n.a.	7.8
Loudon County	6.7	5.8	4.7	6.8	9.9
Monroe County	5.3	6.7	5.0	8.6	13.7
Tennessee	4.0	4.4	3.0	5.1	9.5
United States	4.5	4.9	4.9	5.6	9.1

a. Because of changes in estimating procedures used by the Tennessee Department of Employment Security, state and local rates for 1974 and 1975 are not comparable with those for earlier years. The 1975 rates are not seasonally adjusted.

b. Includes Knox, Anderson, and Blount Counties and all of Oak Ridge through 1970. In subsequent years, also includes Union County.

Source: Tennessee Department of Employment Security and the U.S. Bureau of Labor Statistics.

Table 18

Per Capita Personal Income
in the Three Counties for the Year 1973
As Compared with Tennessee and the United States

<u>County</u>	<u>Per Capita Personal Income In Dollars</u>	<u>Percent of Tennessee</u>	<u>Percent of United States</u>
Blount	\$3,808	91.2	75.8
Loudon	3,669	87.9	73.0
Monroe	2,835	67.9	56.4
United States	5,023	120.3	100.0
State of Tennessee	\$4,174	100.0	83.1

Source: Division of Navigation Development and Regional Studies, TVA, based on data from: U.S. Department of Commerce, Bureau of Economic Analysis.

Table 19

**Percentage Change, 1959-1969, In Selected
Personal Income and Earnings Components for
Loudon County, Tennessee, As Compared
with Selected Counties, the 201-County
Tennessee Valley Region, and the Nation**

Component	Percentage Change			
	Loudon County	Counties with Largest Town 5,001-10,000 in Tennessee Valley Region	Tennessee Valley Region	Nation
Total Personal Income	78.1	116.1	110.7	95.6
Property Income	79.7	160.5	134.1	116.4
Transfer Payments	144.6	156.1	148.2	159.0
Total Earnings	72.0	109.2	107.6	91.4
Farm Earnings	-28.5	36.6	30.7	not available (n.a.)
Nonfarm Earnings				
Government				
Federal	31.6	93.9	89.2	n.a.
State & Local	239.1	134.7	157.9	n.a.
Manufacturing & Mining	78.9	176.2	133.1	n.a.
Contract Construction	28.8	152.1	116.1	n.a.
Transportation, Public Utilities, Communication	57.4	59.2	76.9	n.a.
Wholesale & Retail Trade	56.8	66.5	87.1	n.a.
Finance, Insurance, and Real Estate (F.I.R.E.)	186.3	138.9	118.8	n.a.
Services	113.9	100.6	121.7	n.a.
Other	70.0	34.9	74.4	n.a.

Source: Division of Navigation Development and Regional Studies, TVA, based on data from: U.S. Department of Commerce, Bureau of Economic Analysis, *Estimates of Personal Income, 1959 and 1969*; and U.S. Department of Commerce, Office of Business Economics, *Business Statistics*, 1971 Edition.

Table 20

**Percentage Change, 1959-1969, In Selected
Personal Income and Earnings Components for
Monroe County, Tennessee, As Compared with Selected Counties,
the 201-County Tennessee Valley Region, and the Nation**

Component	Percentage Change			
	Monroe County	Counties with Largest Town 2,500-5,000 in Tennessee Valley Region	Tennessee Valley Region	Nation
Total Personal Income	90.2	82.8	110.7	95.6
Property Income	165.4	141.8	134.1	116.4
Transfer Payments	151.8	119.9	148.2	159.0
Total Earnings	78.2	74.7	107.6	91.4
Farm Earnings	-66.4	27.8	30.7	not available (n.a.)
Nonfarm Earnings				
Government				
Federal	97.4	55.5	89.2	n.a.
State & Local	136.0	120.0	157.9	n.a.
Manufacturing & Mining	n.a.	118.1	133.1	n.a.
Contract Construction	n.a.	46.1	116.1	n.a.
Transportation, Public				
Utilities, Communication	127.2	75.1	76.9	n.a.
Wholesale & Retail Trade	80.0	42.9	87.1	n.a.
Finance, Insurance, and Real Estate (F.I.R.E.)	179.9	109.3	118.8	n.a.
Services	180.0	70.4	121.7	n.a.
Other	159.7	70.5	74.4	n.a.

Source: Division of Navigation Development and Regional Studies, TVA, based on data from: U.S. Department of Commerce, Bureau of Economic Analysis, *Estimates of Personal Income, 1959 and 1969*; and U.S. Department of Commerce, Office of Business Economics, *Business Statistics*, 1971 Edition.

Table 21

Retail Trade, Selected Services, and
Wholesale Trade Data for Blount County, Tennessee

Item	Year					
	1963		1967		1972	
	Number	Index	Number	Index	Number	Index
Retail Trade						
Total sales (\$1,000)	\$ 58,354	74	\$ 78,840	100	\$134,479	171 ^a
No. of establishments	440	99	443	100	527	119
Sales per establishment	\$132,623	75	\$177,968	100	\$255,178	143
Sales to income ratio (%)	65.4%		64.0%		73.9%	
Selected Services						
Total receipts (\$1,000)	\$ 4,355	80	\$ 5,477	100	n.a.	not available
No. of establishments	276	87	317	100	n.a.	n.a.
Receipts per establishment	\$ 15,779	91	\$ 17,278	100	n.a.	n.a.
Receipts to income ratio (%)	4.9%		4.4%		n.a.	n.a.
Wholesale Trade						
Total sales (\$1,000)	\$ 17,274	79	\$ 21,814	100	\$ 46,142	2.2
No. of establishments	36	100	36	100	40	111
Sales per establishment	\$479,833	79	\$605,944	100	\$1,153,550	190

a. As compared with 1967.

Source: Division of Navigation Development and Regional Studies, TVA, based on data from U.S. Bureau of the Census, Census of Business: 1963, 1967, and 1972. Tennessee (Washington: United States Government Printing Office)

Table 22

Retail Trade, Selected Services, and
Wholesale Trade Data for Loudon County, Tennessee

Index	Year					
	1963		1967		1972	
	Number	Index	Number	Index	Number	Index
Retail Trade						
Total sales (\$1,000)	\$ 21,299	81	\$ 26,184	100	\$ 37,369	143 ^a
No. of establishments	278	104	267	100	261	98
Sales per establishment	\$ 76,615	78	\$ 98,067	100	\$143,176	146
Sales to income ratio (%)	71.2%		71.0%		66.5%	
Selected Services						
Total receipts (\$1,000)	\$ 1,252	48	\$ 2,631	100	n.a.	not available
No. of establishments	145	94	154	100	n.a.	n.a.
Receipts per establishment	\$ 8,635	51	\$ 17,084	100	n.a.	n.a.
Receipts to income ratio (%)	4.2%		7.1%		n.a.	n.a.
Wholesale Trade						
Total sales (\$1,000)	\$ 3,195	58	\$ 5,525	100	\$ 17,469	316
No. of establishments	7	38	18	100	22	122
Sales per establishment	\$456,429	149	\$306,944	100	\$794,045	259

a. As compared with 1967.

Source: Division of Navigation Development and Regional Studies, TVA, based on data from U.S. Bureau of the Census, Census of Business: 1963, 1967, and 1972. Tennessee (Washington: United States Government Printing Office)

Table 23

Retail Trade, Selected Services, and
Wholesale Trade Data for Monroe County, Tennessee

Item	Year					
	1963		1967		1972	
	Number	Index	Number	Index	Number	Index
Retail Trade						
Total sales (\$1,000)	\$19,903	76	\$ 26,298	100	\$ 38,665	147 ^a
No. of establishments	272	110	247	100	291	118
Sales per establishment	\$73,173	69	\$106,470	100	\$132,869	125
Sales to income ratio (%)	88.5%		90.0%		81.9%	
Selected Services						
Total receipts (\$1,000)	\$ 1,068	51	\$ 2,097	100	n.a.	not available
No. of establishments	120	85	142	100	n.a.	n.a.
Receipts per establishment	\$ 8,900	60	\$ 14,768	100	n.a.	n.a.
Receipts to income ratio (%)	4.8%		7.2%		n.a.	n.a.
Wholesale Trade						
Total sales (\$1,000)	\$ 9,483	89	\$ 10,664	100	\$ 22,544	211
No. of establishments	13	100	13	100	25	192
Sales per establishment	\$729,462	89	\$820,308	100	\$901,760	110

a. As compared with 1967.

Source: Division of Navigation Development and Regional Studies, TVA, based on data from U.S. Bureau of the Census, Census of Business: 1963, 1967, and 1972. Tennessee (Washington: United States Government Printing Office)

Table 24

Retail Trade, Selected Services, and
Wholesale Trade Data for Knoxville Trade Area:
12 Counties in Tennessee-North Carolina

Item	Year					
	1963		1967		1972	
	Number	Index	Number	Index	Number	Index
Retail Trade						
Total sales (\$1,000)	\$619,247	78	\$793,425	100	\$1,282,932	162 ^a
No. of establishments	4,948	97	5,082	100	5,931	117
Sales per establishment	\$125,151	80	\$156,125	100	\$216,310	139
Sales to income ratio (%)	64.3%		63.0%		65.7%	
Selected Services						
Total receipts (\$1,000)	\$ 70,844	70	\$101,286	100	n.a.	not available
No. of establishments	3,007	87	3,471	100	n.a.	n.a.
Receipts per establishment	\$ 23,560	81	29,181	100	n.a.	n.a.
Receipts to income ratio (%)	7.4%		8.0%		n.a.	n.a.
Wholesale Trade						
Total sales (\$1,000) ^b	\$547,889	73	\$751,313	100	\$1,268,238	169
No. of establishments	720	96	750	100	941	125
Sales per establishment	\$760,957	76	\$1,001,751	100	\$1,347,756	134

a. As compared with 1967.

b. In all years totals do not include data withheld to avoid disclosure for Union County, Tennessee. Sales per establishment calculated on the basis of the number of wholesale establishments for which data are available.

Source: Division of Navigation Development and Regional Studies, TVA, based on data from: (1) U.S. Department of Commerce, Bureau of Economic Analysis, Estimates of Personal Income, 1963, 1967, and 1972; and (2) U.S. Bureau of the Census, Census on Business: 1963, 1967, and 1972 "Retail Trade," Tennessee (Washington: United States Government Printing Office).

Table 25

**Comparison of Selected Characteristics of Housing Stock,
1970, In Three Counties With 201-County Tennessee Valley Region,
the State of Tennessee, and the Nation**

Item	County			201-County Tennessee Valley Region	State of Tennessee	Nation
	Blount	Loudon	Monroe			
Percent of year-round housing units:						
With all plumbing	86.83	84.16	70.09	82.30	85.09	93.09
Owner Occupied	63.64	62.27	53.14	55.67	55.65	not available (n.a.)
Renter Occupied	18.80	17.89	13.24	22.39	25.25	n.a.
With complete kitchen facilities	95.09	91.58	82.41	88.84	90.49	95.56
Percent of occupied housing units:						
Crowded greater than 1.01 persons per room						
Owner Occupied	4.64	5.21	7.87	4.91	4.57	4.20
Renter Occupied	3.16	3.50	4.58	5.13	5.18	4.02
With telephone available	83.56	79.92	71.98	77.96	80.59	86.96
Home-ownership (%)	70.14	70.07	68.17	63.20	62.21	62.86
Owner-occupied housing units:						
Average value (\$)						
All units	14,731	10,892	10,926	14,298	14,834	n.a.
With all plumbing	15,532	11,486	12,127	15,205	15,616	n.a.
Renter Occupied housing units:						
Average monthly rent (\$)						
All units	58.45	47.89	45.55	66.31	70.90	n.a.
With all plumbing ^a	62.67	50.86	50.75	72.17	75.82	n.a.

a. Does not include units without payment of cash rent

Source: Division of Navigation Development and Regional Studies, TVA, from: U.S. Bureau of the Census, *Census of Housing: 1970 "Detailed Housing Characteristics", Tennessee* (Washington: United States Government Printing Office) and "General Housing Characteristics," Final Report HC(1)-A1, U.S. Summary.

Table 26

**Projected General Land Use
Budget For Timberlake**

<u>Land Use</u>	<u>Acres</u>	<u>Percent of Total</u>
Residential	5,700 ^a	35.6
Institutional	600	3.8
Industrial	2,900	18.2
Recreation	3,700 ^b	23.1
Commercial	200	1.2
Open Space	2,900 ^c	18.1
Total	16,000	100.0

a. Includes churches, streets, and utility easements, etc.

b. Includes major regional park, commercial and public recreational use areas.

c. Includes walkways, pathways, buffer zones, shoreline, natural areas and open space connecting community activity centers.

Source: Division of Navigation Development and Regional Studies, TVA.

Table 27

**Probable Losses of Farm Habitat
and Acres of Field Corn Harvested
For Grain at Timberlake,
As Compared to Three Counties**

<u>Item</u>	<u>Three Counties</u>		<u>Timberlake Acres</u>
	<u>Acres</u>	<u>Percent of Area</u>	
Farm habitat base	198,000		5,800
Corn harvested by year:			
1960	21,800	10	580 ^a
1964	16,700	9	520
1970	8,000	4	230

a. Assumes the proportion of corn grown in Timberlake Area is the same as Three County Area

Source: Division of Forestry, Fisheries and Wildlife Development, TVA.

Table 28

General Air Quality Characteristics of Industrial Groups

Industry Group	Possible Types of Air Pollution	Control Equipment Available and Applicable Tennessee Air Pollution Control Regulations
<p>Furniture 2522—Metal office furniture 2541—Wood partitions & fixtures 2542—Metal partitions, store fixtures</p>	<p>Fines and dusts from milling operations; paint and solvent emissions from surface coating; smoke from burning waste lumber, mill ends, fines, and sawdust.</p>	<p>Control equipment that could be used are cyclones, scrubbers, incinerators, and bag filters. Tennessee's emission regulation for particulates, visible emissions, and fugitive dust, and ambient regulations for particulates would apply.</p>
<p>Paper 2641—Paper coating and glazing 2652—Set-up paperboard boxes 2653—Corrugated and solid fiber boxes 2654—Sanitary food containers</p>	<p>Emissions from combustion equipment to provide steam and power for mechanical equipment. It is common for industries of this type to emit nuisance odors.</p>	<p>Control equipment that could be used to control pollution is precipitators, cyclone dust scrubbers, and bag filters. Tennessee's emission regulation for particulates and visible emissions, and ambient regulations for particulates and sulfur dioxide would apply. Tennessee has no regulations on nuisance contaminant such as odor.</p>
<p>Chemicals 2842—Polishes and sanitation goods 2891—Adhesives and gelatin</p>	<p>Emissions of chemicals and the derivative or reaction products of the chemicals in process or in the atmosphere.</p>	<p>Control equipment that could be used to control pollution is cyclones, scrubbers, catalytic combustors, and bag filters. Tennessee's emission regulation for particulates and visible emissions, and ambient regulation for particulates and sulfur oxides would apply.</p>
<p>Stone and Clay 3291—Abrasive products</p>	<p>Dusts from mechanical processes, smoke and fumes from sintering or kiln operation.</p>	<p>Standard collecting equipment could be cyclones, scrubbers, precipitators, and bag filters. Tennessee's emission regulations for particulates, visible emissions, and fugitive dust, and ambient regulations for particulates would apply.</p>

Table 28 (Continued)

Industry Group	Possible Types of Air Pollution	Control Equipment Available and Applicable Tennessee Air Pollution Control Regulations
<p>Primary Metals</p> <p>3315—Steel wire and related products</p> <p>3317—Steel pipe and tubes</p> <p>3361—Aluminum castings</p> <p>3362—Brass, bronze, and copper base alloy castings</p>	<p>Primarily fuming of metallic oxides, and emission of CO, smoke, dust, and ash from melting operations, depending on the volatility and impurities of the metals, scrap, or ore concentration.</p>	<p>Standard collection equipment could be cyclones, venturi scrubbers, and electrical precipitators. Tennessee's emission regulation for particulates, visible emissions, and fugitive dust, as well as ambient regulations for particulates, carbon monoxide, and fluorides would apply.</p>
<p>Fabricated Metals</p> <p>3423—Hand and edge tools</p> <p>3432—Plumbing fixtures</p> <p>3444—Sheet metal work</p> <p>3451—Screw machine products</p> <p>3452—Bolts, nuts, screws, rivets, washers</p> <p>3461—Metal stampings</p> <p>3481—Miscellaneous fabricated wire products</p> <p>3494—Valves and pipe fittings</p> <p>3499—Fabricated metal products</p>	<p>Metals melted are usually refined, and melting operations are easily controlled. Principal air contaminants are metallic fumes, dusts from foundries, and solvent mists and vapors from application of protective coatings in finishing departments.</p>	<p>Pollution abatement equipment could be cyclones, scrubbers, and bag filters. Tennessee's emission regulations for particulates and visible emissions and ambient regulations for particulates would apply. Also the hazardous air contaminant regulations would apply for certain materials.</p>
<p>Machinery, including electric machinery</p> <p>3535—Conveyors and conveying equipment</p> <p>3552—Textile machinery</p> <p>3555—Printing trades machinery</p> <p>3564—Blowers and fans</p> <p>3585—Refrigeration machinery</p> <p>3612—Transformers</p> <p>3621—Motors and generators</p> <p>3623—Welding apparatus</p> <p>3644—Noncurrent-carrying wiring devices</p>	<p>Primarily dusts and mists from finishing departments, some smoke and fumes from quenching in tempering and heat treating. Metal melting is not usually involved.</p>	<p>Pollution abatement equipment could be scrubbers and bag filters. The air pollution emissions regulation that would apply would be emission regulations for particulates and visible emissions, and ambient regulations for particulates.</p>

Table 28 (Continued)

<u>Industry Group</u>	<u>Possible Types of Air Pollution</u>	<u>Control Equipment Available and Applicable Tennessee Air Pollution Control Regulations</u>
Transportation Equipment 3732—Boat building and repairing 3791—Trailer coaches	Captive subsidiary operations may involve foundries, heat treating, woodworking, plating, anodizing, chemmilling, and surface coating operations which contribute all types of air contaminants, including organic vapor emissions from the application, drying, and baking of protective coatings.	Pollution abatement equipment to be used could be cyclones, scrubbers, and bag filters. Tennessee's emission regulations for particulates and visible emissions, and ambient regulations for particulates and sulfur oxides, fluorides, and hydrocarbons would apply.

Source: Division of Environmental Planning, TVA.

Table 29

General Wastewater Characteristics of Industrial Groups

Industry Group	Possible Types of Hydro-Wastes
Apparel 2396—Automotive and apparel trimmings	Possibly small amounts of tanning wastes.
Furniture 2522—Metal office furniture 2542—Metal partitions, store fixtures	Acids, alkalies, cleaning bath residues, cleaning solvents, residues, oil, and dirt from metal stripping and cleaning processes, paint residues, and plating wastes. Plating wastes would not be voluminous but would contain toxic materials such as chromium, cadmium, zinc, copper, nickel, silver and cyanides.
Paper 2641—Paper coating and glazing 2652—Setup paperboard boxes 2653—Corrugated and solid fiber boxes 2654—Sanitary food containers	Wax, paraffin wax, resin, plastic residues, adhesives, and minor quantities of soap and some chemicals. These wastes would have a relatively high biochemical oxygen demand.
Chemicals 2842—Polishes and sanitation goods 2891—Adhesives and gelatin	Liquid wastes from the polishes and sanitation goods industries would include waxes, metal oxides, chlorine compounds, ammonia, caustics, phosphorus compounds, soaps, detergents, and silica. The adhesive and gelatin industries would primarily produce synthetic adhesives such as synthetic rubbers and synthetic (phenol) resins. It is probable that synthetic rubber would not be manufactured here (serious odor and waste disposal problem) but uncured synthetic rubber resins, etc., would be processed into final products.
Stone and Clay 3291—Abrasive products	Liquid wastes from this industry would be largely inorganic in nature, and should be amenable to simple clarification processes such as settling and skimming.

Table 29 (Continued)

Industry Group	Possible Types of Hydro-Wastes
Primary Metals	Liquid wastes would generally be inorganic in nature, and should be amenable to simple treatment. If anodizing were included in the overall operation, toxic chemicals from the anodizing solutions would be present.
3315—Steel wire and related products	
3317—Steel pipe and tubes	
3361—Aluminum castings	
3362—Brass, bronze, and copper base alloy castings	Acids and alkali cleaning bath residues, cleaning solvents, residuals, cutting oils, and dirt from metal stripping galvanizing and cleaning operations. Plating wastes, particularly in the plumbing fixtures industry would include toxic metals such as cadmium, chromium, copper, nickel, zinc, and possibly silver, as well as toxic cyanides. The metal stamping industry would involve large quantities of oil (both lubricating and hydraulic) in the operation and some of it would get into the wash and other waste waters. Small scraps of metal would also be carried away in the wash water.
Fabricated Metals	
3423—Hand and edge tools	
3432—Plumbing fixtures	
3444—Sheet metal work	
3451—Screw machine products	
3452—Bolts, nuts, screws, rivets, washers	
3461—Metal stampings	
3481—Miscellaneous fabricated wire products	
3499—Fabricated metal products	
Machinery, including electric machinery	Materials mainly inorganic in nature. Metal cleaning and metal plating wastes (as described in Fabricated Metals) plus oils, solvents, paint residues, and small metal scraps would be expected. Primarily transformer oils. Plating wastes, grease removed from wire prior to armature windings, acids, and solvents. Residues from hot dip galvanizing process.
3535—Conveyors & conveying equipment	
3552—Textile machinery	
3555—Printing trades machinery	
3564—Blowers and fans	
3585—Refrigeration machinery	
3612—Transformers	
3621—Motors and generators	
3623—Welding apparatus	
3644—Noncurrent-carrying wiring devices	

Source: Division of Environmental Planning, TVA.

Table 30

**Summary of Estimated Cumulative Employment,
Population and Educational and Housing Impact
Associated With Timberlake 20-Year Development Program**

Item	Phase I (1980) Forecast Range		Phase II (1985) Forecast Range		Phase III (1990) Forecast Range		Phase IV (1995) Forecast Range	
	Low	High	Low	High	Low	High	Low	High
Employment	1,500	2,200	3,800	5,700	6,400	9,300	9,200	13,600
Population	4,400	6,200	12,000	17,000	21,000	28,000	31,000	42,000
Education								
Grades K-4	300	500	1,000	1,500	1,900	2,500	2,600	3,600
Grades 5-12	700	1,000	1,800	2,500	3,200	4,300	5,100	6,900
Housing	1,500	2,200	4,300	6,100	7,500	10,000	11,000	16,000

Source: Division of Navigation Development and Regional Studies, TVA.

Table 31

**Summary of Estimated Cumulative Assessed Value
of Real and Personal Property in Timberlake
in Millions of Dollars**

Item	Phase I (1980) Forecast Range		Phase II (1985) Forecast Range		Phase III (1990) Forecast Range		Phase IV (1995) Forecast Range	
	Low	High	Low	High	Low	High	Low	High
Housing (Primary & Secondary)	\$8.1	\$11.8	\$22.4	\$33.4	\$40.7	\$60.0	\$65.6	\$96.0
Commercial	0.9	1.2	2.3	2.8	3.3	4.0	3.3	4.1
Commercial Recreation	1.3	2.0	2.7	4.0	3.3	5.0	3.7	5.7
Industrial Real Estate	1.3	2.1	3.5	5.8	6.4	9.5	9.0	13.6
Industrial Personal Property	2.4	3.8	7.0	10.9	12.2	18.4	18.3	28.5
Railroads	0.1	0.1	.1	.1	.1	.1	.1	.1
TOTAL	\$14.0	\$21.0	\$38.0	\$57.0	\$66.0	\$97.0	\$100.0	\$148.0

Source: Division of Navigation Development and Regional Studies, TVA.

Table 32

**Summary of Estimated Cumulative Solid Waste
Material Generation and Electrical Energy Required
by Population Associated with Timberlake**

Item	Phase I (1980) Forecast Range		Phase II (1985) Forecast Range		Phase III (1990) Forecast Range		Phase IV (1995) Forecast Range	
	Low	High	Low	High	Low	High	Low	High
Solid Waste Material (in thousands of pounds per day) ^a	20	30	70	100	150	600	250	340
Electrical Energy (in million kilowatthours)	60	80	130	180	220	300	310	430

a. The estimate includes residential, commercial, and institutional solid wastes.

Source: Division of Navigation Development and Regional Studies, TVA, based on data from the Division of Environmental Planning.

Table 33

FUELS AND ELECTRIC ENERGY CONSUMED PER EMPLOYEE BY INDUSTRIAL GROUPS

Industry Group	Coal (Short Tons)	Coke (Short Tons)	Fuel Oil (Barrels)	Gas (1,000 Cubic Feet)	Purchased Electricity ^a (thousands kilowatthours)
Apparel					
2396--Automotive and Apparel Trimming ^a	.60	0	1.18	26.67	8.24
Furniture					
2522--Metal office furniture	.02	0	1.81	112.00	11.76
2541--Wood partitions and fixtures	.07	0	1.77	73.08	8.16
2542--Metal partitions, store fixtures	0	0	2.36	118.18	8.16
Paper					
2641--Paper coating and glazing	1.37	0	14.94	184.21	20.73
2652--Setup paperboard boxes	.33	0	3.63	15.00	15.81
2653--Corrugated and solid fiber boxes	.17	n.a.	11.04	160.19	15.81
2654--Sanitary food containers	.88	0	6.88	74.19	15.81
Publishing and Printing					
2761--Manifold business forms	0	0	1.54	37.84	13.51
Chemicals					
2842--Polishes and sanitation goods	.03	0	4.66	105.00	14.56
2891--Adhesives and gelatin	.27	0	77.76	381.82	32.47
Stone and Clay					
3291--Abrasive products	1.15	n.a.	23.00	116.67	42.00
Primary Metals					
3315--Steel wire and related products	.39	.04	8.53	338.46	89.93
3317--Steel pipe and tubes	1.35	0	3.89	422.73	89.93
3361--Aluminum castings	.17	0	2.20	365.85	22.67
3362--Brass, bronze, and copper base alloy castings	.24	n.a.	6.04	175.00	22.67

Table 33 (continued)

Industry Group	Coal (Short Tons)	Coke (Short Tons)	Fuel Oil (Barrels)	Gas (1,000 Cubic Feet)	Purchased Electricity ^a (thousands kilowatthours)
Fabricated Metals					
3423--Hand and edge tools	.43	n.a.	6.57	125.00	13.16
3432--Plumbing fixtures	.11	n.a.	1.83	100.00	13.64
3444--Sheet metal work	(b)	0	6.53	122.58	13.21
3451--Screw machine products	.11	0	3.84	66.67	15.46
3452--Bolts, nuts, screws, rivets, washers	.31	0	5.62	146.55	15.46
3461--Metal stampings	1.59	n.a.	2.55	88.94	18.75
3481--Misc. fabricated wire products	.02	0	3.91	98.11	11.32
3494--Valves and pipe fittings	.40	n.a.	4.12	158.51	16.49
3499--Fabricated metal products	.31	n.a.	3.23	134.09	16.49
Machinery, including electric machinery					
3535--Conveyors and conveying equipment	.20	0	1.84	84.00	13.58
3552--Textile machinery	.02	n.a.	12.53	43.75	10.27
3555--Printing trades machinery	.43	0	4.73	37.50	10.27
3564--Blowers and fans	.08	0	6.12	118.18	13.65
3585--Refrigeration machinery	1.78	0	2.83	106.35	12.87
3612--Transformers	1.18	0	9.65	65.22	12.96
3621--Motors and generators	.77	0	1.46	95.74	22.95
3623--Welding apparatus	.60	0	1.58	153.85	22.95
3644--Noncurrent carrying wiring devices	.90	n.a.	6.00	87.50	12.35
Transportation Equipment					
3732--Boat building and repairing	.04	0	3.08	23.33	4.40
3791--Trailer coaches	(b)	0	.45	40.24	5.05

a. Denotes average computed using 3-digit energy and employment data.

b. Less than 0.005 short tons per employee.

Source: Division of Navigation Development and Regional Studies, TVA used published reports of the U.S. Bureau of the Census, 1972 Census of Manufacturers, Fuels and Electric Energy Consumed and Industry Series.

Table 34
 Summary of Possible Land Use Budget
 for Selected Recreational Activities at Timberlake

<u>Type of Facility</u>	<u>Acres</u>	<u>Percent of Total</u>	<u>Probable Development Sector</u>	
			<u>Public</u>	<u>Private</u>
Camping	50	1.4	X	
Motels, Resort, Cabins	125	3.4		X
Marinas, Boat Ramps	100	2.7	X	X
Golf, Riding, Swimming	600	16.2	X	X
Hiking and Day Use	900	24.3	X	
Wilderness and Group Camps	150	4.0	X	
Reserve	<u>1775</u>	<u>48.0</u>		
Total	3700	100.0		

Source: Division of Navigation Development and Regional Studies, TVA.

Table 35

Chronological Listing of Historical and Cultural Features in the Timberlake Area

Date	Item	Listed National Register of Historic Places	Located on Timberlake Site	Summary Remarks ^a
c. 1756	The Virginia Fort Site			The Virginia Fort, as it is called, was located on Four Mile Creek across the Little Tennessee River from Chota. The fort was built by the colony of Virginia at the request of the Cherokees. Since it was never garrisoned, little historical attention has been given to it although it was the first British Colonial fort completed west of the Alleghenies. No recorded archaeological search for this site is known. Therefore, the exact location has never been determined.
c. 1756- 1760	Fort Loudoun	X ^b	X	<p>The importance of Fort Loudoun to American history is its minor role on the southwestern frontier during the French and Indian War. It was the first occupied fort west of the Alleghenies and therefore was the first Colonial settlement this side of those mountains.</p> <p>Upon completion of the Tellico project, recreated Fort Loudoun will be located on an approximately 500-acre island. A public park environment is presently planned for the remainder of the island and will be developed to complement the fort setting.</p>
c. 1673- 1788	Chota Site	X	X	The existence of Chota as important to the history of the United States spans a period of about 60 years. During this time, it was the residence of several principal chiefs, including Oconostota, Attakullakulla, and for a time at least, Nancy Ward, the "Beloved Woman."

Table 35 (continued)

Date	Item	Listed National Register of Historic Places	Located on Timberlake Site	Summary Remarks ^a
				<p>Tanassee (from which the State of Tennessee takes its name) is thought to be nearby. But the location has not been found. It is also listed on the National Register of Historic Places.</p> <p>Archaeological exploration of Chota is in the process. TVA plans to reconstruct the council house as part of the Tellico project. A public use environment is presently planned for the area near the site and will be developed to complement the reconstruction and park-life setting. During this period, the principal era of contact between whites and Cherokees before and during the Revolution, Chota was the political and military center of the Cherokee Nation, the site of ceremonies, the place to receive emissaries, and a major trading center. After the murder of Old Tassel in June 1788, almost all reference to Chota ceases.</p>
c. 1786	Coytee Spring (Coytee Schoolhouse)		c	<p>Coytee Spring has been a gathering place for local residents, both Indian and white, for many generations. A fairly well-preserved schoolhouse of general post-Civil War architecture still stands on a bluff above the spring. It is a typical one-room school of the period and has been used as a tobacco barn for some years.</p> <p>Coytee Spring will be inundated by the Tellico Reservoir. But the Coytee schoolhouse will be preserved by TVA as an example of the type. Neither historically nor architecturally is it eligible for the National Register of Historic Places.</p>

Table 35 (continued)

Date	Item	Listed National Register of Historic Places	Located on Timberlake Site	Summary Remarks ^a
c. 1793- 1807	Tellico Blockhouse	d	X	<p>The first stage of the Tellico Blockhouse was believed to have been completed before March 1793, some 12 miles inside Cherokee lands. According to the Treaty of Holston, its original purpose was to serve as a residence for Federal representatives who were to "lead" the Cherokee Nation "to a greater degree of civilization, and to become Herdsmen and cultivators, instead of remaining in a state of hunters."</p> <p>After passage of the Congressional Act of May 19, 1796, the Tellico Blockhouse became one of the first two Indian trading posts sponsored and paid for by the Federal Government, called "factories." The purposes of the factory at Tellico were to trade with the Indians, recover by trade monies given to the Indians as treaty annuities, and to corner the fur trading business of the British and Spanish. About 1807 the functions (and probably the timbers) of the Blockhouse were moved to the Hiwassee Garrison.</p> <p>The Blockhouse has been excavated, and plans are to develop the remains of the foundation works as an historic interpretive area. The setting for the site will be park-like.</p>
c. 1813	Town of Morganton Site (Morganton Cemetery)		e	<p>Morganton (originally called Portsville) was established by legislative act in 1813. Morganton became a river port of some consequence for the area from Maryville to below Madisonville. The town site was at the mouth of Bakers Creek. About 1900 the Knoxville Augusta Railroad was completed several miles southeast of the town, and Morganton died a natural death.</p>

Table 35 (continued)

Date	Item	Listed National Register of Historic Places	Located on Timberlake Site	Summary Remarks ^a
				Nothing now remains of the town to warrant nomination to the National Register of Historic Places. The Morganton Cemetery is the only evidence of the existence of Morganton. The Morganton Cemetery was started following the establishment of a Presbyterian church in the town soon after the transfer of this land to the U.S. in 1805. The cemetery is located on a hill which will overlook the Tellico Reservoir and will be included in the open space system.
c. 1819	Davis House			Somewhat changed through the generations, the Jonathan Davis house at David Ford on the Little Tennessee was one of the oldest log houses in the area. The house was moved to a location near Jellico, Tennessee, by the property owners at the time the land was purchased by TVA for the Tellico project.
c. 1820	William Dickson House (Tipton House)		X	The first Monroe County Court met at the log home of William Dickson in 1820. The most recent property owner built a brick shell around the log house and removed all vestiges of the structure inside. Nothing remains of the original Dickson house to nominate it to the National Register of Historic Places.
c. 1828	Wyly Cemetery and House		X	A house is of interesting architecture. The owners of the Wyly property have reserved the house and will remove it from the site. The Wyly Cemetery where James Wyly is buried is on a hill overlooking the farm. It will be included in the open space system.

Table 35 (continued)

<u>Date</u>	<u>Item</u>	<u>Listed National Register of Historic Places</u>	<u>Located on Timberlake Site</u>	<u>Summary Remarks^a</u>
c. 1820- 1830	Jackson-Hughes Stonehouse ^f			John Hughes reportedly built this house. The plan and construction indicate that it was a typical log house constructed of stone instead of logs. The house was destroyed by fire in May 1975 before TVA came into possession of the property.
c. 1820	Bowman's Chapel Methodist Church ^f			John Bowman, an early Methodist circuit rider is supposed to have built the original log chapel, which was one of the first churches in what is now Loudon County. This building was later replaced by a frame church which has been torn down.
c. 1828	George Bowman House	X	X	Historically, except for its age, this house is not more significant than several other Loudon and Monroe County farm dwellings. It will be included in the open space system.
c. 1840	Hughes Brick House	h	g	This house remains in private ownership. Development associated with Timberlake should not adversely affect the property.
c. 1850	McCollum Farm	h	g	The McCollum farm complex is located on the Greenback-Morganton Road. Very few farm complexes of this extent and age remain in tact and use. Development associated with Timberlake should not adversely affect the property.

Table 35 (continued)

Date	Item	Listed National Register of Historic Places	Located on Timberlake Site	Summary Remarks ^a
c. 1857	St. Andrew's Chapel and the McGhee Cemetery		g	The cemetery is located near the Tellico Blockhouse. The chapel has been dismantled. The interpretive theme planned for the Tellico Blockhouse site should not have an adverse impact on the cemetery.
c. 1866	The McGhee House "Tuskega"	X	X	Charles McClung McGhee began "Tuskega" shortly before the Civil War. The house is an early Gothic cottage and the only house in the Little Tennessee valley, predating this century, which is not built on a traditional pattern. The brick for the house was made in a kiln on the site of Tellico Blockhouse. The house is still standing in fair condition although the grounds have partly returned to nature. It is the intent of TVA to preserve the house and incorporate it into the open space system.
c. 1873	National Campground	X	g	In September 1873, a "few well disposed Christian men" of Loudon County, banded together to organize a tabernacle meeting. The first such meeting was held in a tent at the spot where the Campground was later located. The site is on the road to Jackson's Ferry. The National Campground claims to be the oldest continuous such religious undertaking in the United States. Development associated with Timberlake should not adversely affect the property.
i	Hopewell Mill		X	Very little is known about the origin of this abandoned mill. It probably dates from mid-19th Century. This structure, although not of sufficient historic or architectural importance to be eligible for the National Register of Historic Places is interesting. The mill is in need of extensive repair.

Table 35 (continued)

Date	Item	Listed National Register of Historic Places	Located on Timberlake Site	Summary Remarks ^a
c. 1912	Bacon House		X	It is questionable if any of the present structure was a part of the original house which was built before the Civil War and reportedly destroyed by fire before World War I. The present house is an early 20th Century structure, showing architectural kinship to various styles, including the late Queen Ann and the bungalow. It will be included in the open space system.

- a. A more detailed summary description of the features is available from TVA upon request.
- b. Also a National historic landmark.
- c. The Coytee Spring School is located on the Timberlake site.
- d. The Blockhouse has been nominated to the Register by TVA and declared eligible.
- e. Morganton Cemetery is located on the Timberlake site.
- f. Description of this feature is included as a matter of historical record.
- g. Adjacent to the Timberlake site.
- h. TVA understands there is local interest to nominate the feature to the National Register of Historic Places.
- i. Date unknown.

APPENDIX C

LIST OF EXHIBITS IN PROJECT FILE

The following materials are available for inspection on request. Contact TVA: M. I. Foster, 511 Arnstein Building, Knoxville, Tennessee 37919; Telephone 615/637-0101, extension 2721.

<u>Exhibit No.</u>	<u>Title</u>
1	<i>Agreement Between Tennessee Valley Authority and Tennessee State Planning Commission Relating to Planning Assistance for Loudon and Monroe Counties - Contract No. TV-36693A, July 1972.</i>
2	<i>Agreement Between Tellico Area Services System and Tennessee Valley Authority Relating to Construction of Water System - Contract No. TV-37837A, May 1973.</i>
3	Amendment 1 to Tennessee House of Representatives Joint Resolution No. 167, April 1973 (establish special legislative advisory committee - land use planning)
4	Bureau of Business Research University of Tennessee, <i>Blount County Industrial Survey</i> , 1957.
5	Bureau of Business and Economic Research Memphis State University, <i>Population Economic Base and Potential East Tennessee Economic Development District</i> , March 1967.
6	Bureau of Education Research and Service, University of Tennessee, <i>Charrette Little Tennessee Valley</i> , 1970.
7	Betson, Roger P., and Buckingham, R. A., "Fecal Coliform Concentrations in Stormwater."
8	Caudill, Rowlett, Scott, <i>Proposal for The Planning and Design of Educational Facilities for Timberlake</i> , September 1972.
9	Charles Temple, <i>A Study of the Vocational Needs of the Alcoa Blount County and Maryville School Systems</i> , University of Tennessee, June 1970.
10	Chamber of Commerce of U.S., <i>What New Jobs Mean to a Community</i> , 1973.
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APPENDIX D

Review Agency Comments and TVA Responses

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

1720 Peachtree Rd., N.W.
Atlanta, Georgia 30309

February 10, 1975

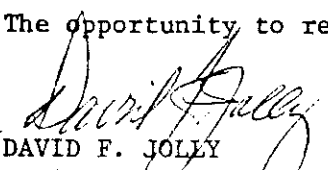
Mr. Peter A. Krenkel
Director, Division of Environmental Planning
Tennessee Valley Authority
206 401 Building
Chattanooga, Tennessee 37401



Dear Mr. Krenkel:

Environmental concern has obviously been incorporated into the design of this proposed new community. We have no substantial comment to offer.

The opportunity to review this draft statement is appreciated.


DAVID F. JOLLY
Regional Environmental Coordinator
Programs & Land Use Planning

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

561 U. S. Courthouse, Nashville, Tennessee 37203

June 14, 1975

Dr. Peter A. Krenkel
Director of Environmental Planning
Tennessee Valley Authority
Chattanooga, Tennessee 37401

Dear Dr. Krenkel:

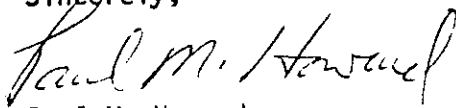
The draft environmental impact statement for the Timberlake New Community in Loudon and Monroe Counties, that was addressed to Federal Agencies on November 29, 1974, was referred to the Soil Conservation Service for review and comment.

We have reviewed the draft statement and offer these comments for your consideration:

1. We suggest that the Planning and Development Approach as described on page 4 provide for continued use as long as possible of the more productive agricultural land for food production.
2. The following items should be checked on Table 3:
 - a. Apparently the 0.3 percent slope range for Lindside is a typographical error and should be 0 to 3.
 - b. Permeability of Litz seems to be high. Rate should be 0.2 to 0.6 which is moderately slow.
 - c. Permeability for Talbott should be 0.2 to 0.60.
 - d. Permeability for Tellico should be 0.6 - 2.0.
 - e. Whitesburg soils are moderately well drained.
3. The following items should be checked on Table 4.
 - a. Soil limitation for Colbert should be severe for sanitation facilities.
 - b. Soil limitation for Leadvale should be severe for sanitation facilities.
 - c. Soil limitation for Sequoia should be severe for sanitation facilities.

We appreciate the opportunity to review this draft environmental impact statement.

Sincerely,


Paul M. Howard
State Conservationist

cc: K. E. Grant, Administrator, SCS, (1 copy)
Office of the Coordinator of Environmental
Quality Activities (1 copy)
Council on Environmental Quality (5 copies)



TVA Responses to Comments from
U.S. Department of Agriculture

TVA agrees that it is important for good agricultural land to be properly used for food production where overriding demands do not dictate otherwise. As stated on page 23, TVA is presently issuing short-term licensing agreements for purposes related to agriculture on about 6,000 acres of the site. Where practical, the more productive agricultural land will be incorporated into the Timberlake open space system so that its use for purposes related to agriculture can be continued as long as practical. Tables 3 and 4 have been changed accordingly.



**DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD**

MAILING ADDRESS:
U.S. COAST GUARD (C-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 420-2262

3 FEB 1975

Dr. Peter A. Krenkel
Director of Environmental Planning
Tennessee Valley Authority
Chattanooga, Tennessee 37401

Dear Dr. Krenkel:

This is in response to your letter of 29 November 1974 addressed to DOT Director, Office of Environmental Quality concerning a draft environmental impact statement on the Timberlake New Community.

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,

W. E. Caldwell

W. E. CALDWELL
Captain, U.S. Coast Guard
Deputy Chief, Office of Marine
Environment and Systems
By direction of the Commandant



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

January 22, 1975

Dr. Peter A. Krenkel
Director of Environmental Planning
Tennessee Valley Authority
Chattanooga, Tennessee 37401

Dear Dr. Krenkel:

We have reviewed the Draft Environmental Impact Statement for the proposed Timberlake New Community in Blount, Loudon, and Monroe Counties, Tennessee, and find that it is well done. However, we also find that there are areas of concern for which we have environmental reservations and for which additional information is needed. For this reason, we have assigned a rating of ER- (environmental reservations) 2 (lack of information) to the project and to the Impact Statement.

First, we feel some points in the discussions of water quality and planned wastewater treatment should be clarified.

We note that plans call for the use of package plants initially, adding units to these, and then replacing these with a permanent plant of 11MGD capacity several years hence. We suggest that the alternative of building a permanent plant of about 3 MGD first and then increasing the capacity of the plant as needed would be a more practical approach. A brief discussion of why the proposed method of waste treatment was selected over other alternatives would improve the Statement.

We further recommend:

1. Identification of methods used to calculate expected mean concentrations of nitrogen and phosphorus values.
2. Clarification of whether or not relative contributions from Timberlake to Tellico Reservoir are based on wasteloads from the 11 MGD plant -- with phosphorus removal.
3. Identification of the types of industries and quantities of water these industries are expected to contribute to the reservoir.

- 2 -

4. Identification of type of treatment to be provided in the alternative of discharging to the Watts Bar Reservoir.

We must point out here that there is need for concern of the initial high values of phosphorus in Tellico Reservoir. While 0.034 mg/l would not be considered eutrophic, neither would it be considered oligotrophic (as a young lake should be). Based upon the recently completed Lake Eutrophication Study, Tellico Reservoir would be considered meso-eutrophic, which is a transition classification approaching eutrophic conditions. This possibility exists for nuisance algal conditions to develop in the lake during late summer. As such, strong consideration should be given to the removal of all wastes from the lake, including nutrient-rich drainage from residential areas.


Another concern is location of the community in a valley subject to extended periods of air stagnation of four days duration. While possible sources of air pollutants are identified in the Statement, and the frequency of calm winds and low ceilings is estimated, we do not feel, however, that the statement, "Activities associated with Timberlake should pose minimal air quality problems even during these infrequent stagnation episodes," is documented.

We recommend that an estimate of gross emissions from the proposed community be made and the impact of emissions of air quality be quantified. Where possible, projected source data from Timberlake Community should be used in the estimates; however, where necessary, we suggest that emissions from similar communities be utilized.

Finally, in regard to noise impact, documentation of the existing environment should be provided, using as criteria guidelines as published in HUD Circular 1390.2.

We would appreciate receiving five copies of the final environmental impact statement when it is available. If we can be of further assistance in any way, please let us know.

Sincerely,


Jack E. Ravan
Regional Administrator

TVA Responses to Comments from
United States Environmental Protection Agency

COMMENT

"We note that plans call for the use of package plants initially, adding units to these, and then replacing these with a permanent plant of 11MGD capacity several years hence. We suggest that the alternative of building a permanent plant of about 3MGD first and then increasing the capacity of the plant as needed would be a more practical approach. A brief discussion of why the proposed method of waste treatment was selected over other alternatives would improve the Statement."

RESPONSE

As stated elsewhere in this statement, TVA desires "Timberlake to be carried out in a manner permitting early decisions to be made without foreclosing future desirable program options" (Section IV.A.) and ". . . that optimum participation by the private sector is important." Recognizing these objectives, system studies were conducted to select a strategy for treatment which will maintain water quality standards, but at the same time provide a lower risk financial position during the initial years by reducing front-end costs and has the flexibility for physical plan changes. As presently conceived, in the early years of the project the various activity components may be separated by distance and/or other physical features which would require an extensive sewerage and pumping system, therefore, making it impractical for either government or the private sector to service these facilities from a central plant. Further, during the early years of development, package treatment plants will be utilized since a final selection for the permanent system made during the early stages would rule out technical advances in waste treatment that might be developed before construction of the permanent system is required; however, should development of new methods of treatment not take place as expected, the final selection will be made from among the identified alternatives which are based on today's technology.

COMMENT

"1. Identification of Methods used to calculate expected mean concentrations of nitrogen and phosphorus values. 2. Clarification of whether or not relative contributions from Timberlake to Tellico Reservoir are based on wasteloads from the 11 MGD plant--with phosphorus removal."

RESPONSE

Nitrogen and phosphorus contributions from Timberlake were estimated using contributions of 12 pounds per capita per year nitrogen and 2-1/2 pounds per capita per year phosphorus and assuming removal efficiencies for conventional primary and secondary treatment processes of 50 percent for nitrogen and 10 percent for phosphorus. To arrive at the total future nutrient load in Tellico Reservoir, the projected treated load from Timberlake was added to the mean concentration of total nitrogen and phosphorus expected in Tellico Reservoir which included an allowance for inflows through the canal from Fort Loudoun Reservoir.

Section I.E., Water Quality, has been rewritten to clarify the expected net increase in concentrations of total nitrogen and phosphorus in Tellico Reservoir resulting from Timberlake. The impact was estimated assuming a discharge of 11 million gallons per day (MGD) and did not include phosphorus removal.

COMMENT

"3. Identification of the types of industries and quantities of water these industries are expected to contribute to the reservoir."

RESPONSE

The identified industries are shown in table 2 of Appendix B. Applying water use statistics available from existing industries in the Tennessee Valley and the forecasted industrial employment in the Timberlake area, a rough estimate of the industrial wastewater discharge at the end of the 20-year development period would be about 1.5 million gallons per day.

COMMENT

"4. Identification of type of treatment to be provided in the alternative of discharging to the Watts Bar Reservoir.

We must point out here that there is need for concern of the initial high values of phosphorus in Tellico Reservoir. While 0.034 mg/l would not be considered eutrophic, neither would it be considered oligotrophic (as a young lake should be). Based upon the recently completed Lake Eutrophication Study, Tellico Reservoir would be considered meso-eutrophic, which is a transition classification approaching eutrophic conditions. This possibility exists for nuisance algal conditions to develop in the lake during late summer. As such, strong consideration should be given to the removal of all wastes from the lake, including nutrient-rich drainage from residential areas."

RESPONSE

The method for any alternative treatment concept will be selected from systems available in the early 1980's. Whichever method and concept is finally selected, existing applicable regulations will be observed. Presently it appears that conventional secondary treatment and effluent chlorination will be sufficient for that part of the system treating waste generated from Timberlake north of the Bat Creek Knobs described in alternative 1, page 35. TVA believes that the concentrations of nutrients (nitrogen and phosphorus) in Tellico Reservoir will not be high enough to lead to accelerated eutrophication (excessive growths of algae). This belief is based upon experience with nitrogen and phosphorus levels in other reservoirs in the Tennessee Valley. For reference, inflowing waters to nearby Douglas Reservoir show mean concentrations of 0.74 mg/l total nitrogen and 0.100 mg/l total phosphorus. Similarly inflows to Fort Loudoun Reservoir show 1.17 mg/l total nitrogen and 0.119 mg/l total phosphorus. Excessive blooms of algae have not been observed in either of these reservoirs.

As regards the effect of Timberlake on eutrophication in Tellico, the waters of Tellico Reservoir after Timberlake is fully developed will still be some of the least eutrophic in the Tennessee Valley. TVA will monitor water quality in Tellico Reservoir during development and should water quality be impaired by Timberlake discharges, consideration will be given to additional pollution control measures.

COMMENT

"Another concern is location of the community in a valley subject to extended periods of air stagnation of four days duration. While possible sources of air pollutants are identified in the Statement, and the frequency of calm winds and low ceilings is estimated, we do not feel, however, that the statement, 'Activities associated with Timberlake should pose minimal air quality problems even during these infrequent stagnation episodes,' is documented.

We recommend that an estimate of gross emissions from the proposed community be made and the impact of emissions of (sic) air quality be quantified. Where possible, projected source data from Timberlake Community should be used in the estimates; however, where necessary, we suggest that emissions from similar communities be utilized."

RESPONSE

No specific site data are available for use in making emissions estimates at this early date including industrial sources which are considered a probable primary influence on the long-term air quality (see page 26 of draft EIS). Further in view of the uniqueness of Timberlake (e.g., linear spatial orientation and significant topographic features), identification of "similar communities" would be highly speculative and would not necessarily reflect an industrial mix that may ultimately locate at Timberlake. Nevertheless, simple air quality estimates were attempted using a technique promulgated by the U.S. Environmental Protection Agency (August 14, 1971, Federal Register, "Requirements for Preparation, Adoption, and Submittal of Implementation Plans," p. 15494). The estimated results are shown below as compared to ambient air quality standards.

<u>Pollutant</u> ^a	<u>Gross Estimate of Timberlake Emissions (tons per year)</u>	<u>Estimated Annual Concentration In Micrograms per Cubic Meter ($\mu\text{g}/\text{m}^3$)</u>	<u>Federal and State of Tennessee Ambient Standards</u>	
			<u>Primary ($\mu\text{g}/\text{m}^3$)</u>	<u>Secondary ($\mu\text{g}/\text{m}^3$)</u>
Suspended particulate	149	2.0	75 ^b	60 ^b
Sulfur dioxide	128	1.7	80 ^c	80 ^d
Carbon monoxide	1,890	25.7	10,000 ^e	10,000 ^e
Nitrogen dioxide	310	4.2	100 ^c	100 ^c
Total hydrocarbons	342	4.6	160 ^f	160 ^f

Notes

- a. Emissions were estimated by apportioning 1970 emission estimates of suspended particulates, SO₂, CO, NO₂, and by hydrocarbons in Blount, Loudon, and Monroe Counties, Tennessee, to Timberlake on the basis of area (the higher of the three county values was used) on the premise that existing emissions in these three counties may be considered generally representative of the future mix of Timberlake emissions.
- b. Annual geometric mean.
- c. Annual arithmetic mean.
- d. Annual arithmetic mean - Tennessee only.
- e. Maximum 8-hour concentration.
- f. Maximum 3-hour concentration.

To accurately simulate air quality levels in a community during infrequent air stagnation periods requires specific detailed emission information including relative locations (source density) and release conditions (exit temperatures, flow rates, etc.), because pollutant levels produced by low-level sources under such conditions are strongly dependent upon the magnitude of the emissions. Obviously, such emission inventory estimates are not available for Timberlake. It should be reiterated, however, that industries proposing to locate at Timberlake would be required to employ the best available air pollution control technology for meeting New Source Performance Standards, thereby reducing their potential air quality impact, and to meet emerging Federal regulations concerning significant deterioration. As stated in the draft environment impact statement, TVA will give full consideration to the potential impact of each industry on air quality and where appropriate will place appropriate covenants and restrictions in deeds or other instruments of conveyance of land or land rights to control potentially detrimental air quality situations.

Based upon the above estimates of low annual emissions and concentrations, the imposition of stringent emission standards and a construction permit requirement for new plants established by the Federal and state regulatory scheme, and the review by TVA of the potential impacts of industrial land usage, emissions from activities associated with Timberlake should have a minimal adverse air quality impact on the area.

COMMENT

"Finally, in regard to noise impact, documentation of the existing environment should be provided, using as criteria guidelines as published in HUD Circular 1390.2."

RESPONSE

TVA plans to take background noise measurements after completion of the Tellico project, and the reservoir has been filled. As stated in the draft EIS, TVA intends that Timberlake be developed to minimize noise problems and plans to monitor noise levels as development takes place and arrange spatial use patterns accordingly. Noise evaluations will be conducted in full cognizance of HUD Circular 1390.2.



D-12

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION IV
50 7TH STREET N.E.
ATLANTA, GEORGIA 30323

OFFICE OF THE
REGIONAL DIRECTOR

January 27, 1975

Re: 476-12-74

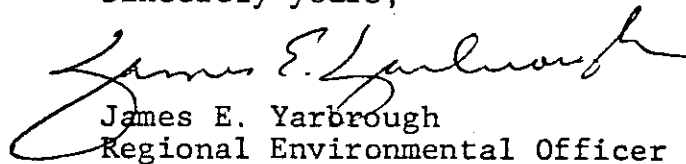
Peter A. Krenkel, Ph.D., P.E.
Director of Environmental Planning
Tennessee Valley Authority
Chattanooga, Tennessee 37401

Dear Dr. Krenkel:

Subject: Timberlake New Community
Tennessee Valley Authority
Loudon and Monroe Counties
Tennessee

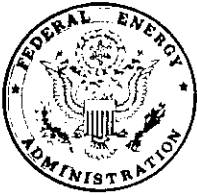
We have reviewed the subject draft Environmental Impact Statement. Based upon the data contained in the draft, it is our opinion that this proposed action will have only a minor impact upon the human environment with respect to the concerns of this Department. However, we are of the opinion that an EIS should be prepared on each of the five year projects as they come closer to actuality. These individual EIS's could concentrate on a smaller area and be more specific and not so general in nature.

Sincerely yours,


James E. Yarbrough
Regional Environmental Officer

TVA Responses to Comments from
Department of Health, Education, and Welfare

TVA recognizes that this statement is of necessity somewhat general and that it may be necessary to prepare more specific environmental assessments at a later time in the life of the project. However, we believe it would be premature to commit at this time to prepare a statement on each specific project stage plan. TVA believes the procedural commitments made by the agency in Section IV, "Program Management," of the statement offer an appropriate method to assure long-term environmental and other quality objectives are pursued at Timberlake.



FEDERAL ENERGY ADMINISTRATION

WASHINGTON, D.C. 20461

21 JAN 1975

OFFICE OF THE ASSISTANT ADMINISTRATOR

Dr. Peter A. Krenkel
Director of Environmental Planning
Tennessee Valley Authority
Chattanooga, Tennessee 37401

Dear Dr. Krenkel:

This is in response to your request for our review and comments on the draft environmental statement, Timberlake New Community, Loudon and Monroe Counties, Tennessee.

The environmental statement does not discuss energy conservation. Since a new community provides an opportunity to maximize energy conservation measures in the design of residential, commercial, industrial and public buildings, we suggest that such measures should be carefully considered. The environmental impact statement should reflect this consideration.

We also think that the Alternatives section would be greatly improved if it included a discussion of the energy requirements associated with each alternative development.

We hope that these comments will be helpful to you in the preparation of the final statement and in further consideration of the proposal.

Sincerely,

A handwritten signature in cursive script that reads "Roger W. Sant".

Roger W. Sant
Assistant Administrator
Energy Conservation and Environment

TVA Responses to Comments from
Federal Energy Administration

TVA believes the section, "Energy Conservation and Technological Development," reflects a consideration by TVA regarding future planning of energy conservation measures at Timberlake. Cooperative activities are currently underway between TVA and the University at Buffalo Foundation, Inc., (New York) to conduct a program of general investigative research related to the interactions between energy use, conservation, and management systems and land use planning, development, and building design for possible application to Timberlake. Other studies and participants are expected as planning and development progress.

At this time in the planning process, only general assumptions and conclusions can be made regarding the energy requirements associated with each alternative development discussed in the section, "Alternatives to the Proposed Action," on page 42. Generally speaking, the activities taking place on the site described in each alternative would use less energy than the entire community of Timberlake; however, in each alternative it is assumed that the people employed on the site and participating in the recreational activities would consume energy wherever they resided including the energy resources required to transport them to and from the site. In TVA's opinion, the comprehensive approach to planning and developing the total Timberlake concept together with the stated demonstration goal of minimizing the energy consumption of an entire community offers the opportunity to utilize energy resources on a per capita basis in a more efficient manner than the stated alternatives.



REGION IV
Peachtree-Seventh Building
50 Seventh Street, N.E.
Atlanta, Georgia 30323

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
KNOXVILLE AREA OFFICE
ONE NORTSHORE BUILDING
1111 NORTSHORE DRIVE
KNOXVILLE, TENNESSEE 37919

January 7, 1975

IN REPLY REFER TO:
4.7PPC (Steve
Shields 637-9300
ext 1218)

Peter A. Krenkel, Ph.d., P.E.
Director of Environmental Planning
Tennessee Valley Authority
Chattanooga, Tennessee 37401

Dear Mr. Krenkel:

We have reviewed the Draft Environmental Statement - Timberlake New Community and have the following comments:

1. When will the General Plan be done? The Project Stage Plans? How will their impacts be assessed?
2. Each developmental phase will be evaluated in terms of its potential impact on the site. Will each developmental phase be evaluated in terms of its impact on the other developmental phases and them on it?
3. When will the further agreement with Boeing be entered into? Or has it already?
4. How will the ETDD regional plans (open space, Community Facility Land Use Plan etc.) effect Timberlake and how will Timberlake effect them?
5. How will Timberlake complement the Development Strategy adopted by ETDD? What type of growth was predicted for the Loudon-Lenoir City Area and the Sweetwater-Madisonville area? How does the proposed Timberlake Development relate to these growth strategies? All the Environmental Impact Statement says is that Timberlake is expected to complement the development strategy.
6. In regards to the possible flood hazard, will TVA use standards established by the FIA? Will TVA use the 100-year flood elevation as the standard for first flood elevations in flood hazard areas?
7. Are projected traffic counts available for those major highways on which the volume is expected to increase? These counts should be given to determine whether or not there will be any

2.

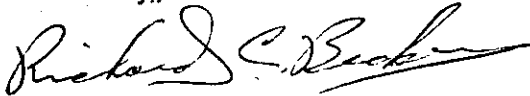
adverse impacts upon certain land uses. There are noise level criteria available for different land uses which could be compared with the projected noise levels for certain areas of Timberlake. This would show where the impacted areas are.

A closer look needs to be taken at the possible noise impact caused by the railroad. With the increase in industrial development throughout this area it is safe to assume that the number of trains operating in this area will also increase. Some type of noise calculations based on the number of projected night time operations needs to be done in order to determine their impact on the surrounding environment.

8. If HUD sponsored housing projects are planned for future development, HUD Handbook 1390.2 will be applicable in evaluating the noise situation.
9. The Environmental Impact Statement states "There are no existing fire protection services available in the Timberlake area. While no specific arrangements have been made, the developer is expected to provide or sponsor...". To protect the area from possible adverse impacts of a major fire it would seem necessary for TVA to provide in their plans for fire protection service at the earliest stages of development as well as later.

If you have any further questions, please contact us.

Sincerely,



Richard C. Becker
Environmental Clearance Officer

TVA Responses to Comments from
Department of Housing and Urban Development

COMMENT

"1. When will the General Plan be done? The Project Stage Plans: How will their impacts be assessed? Each developmental phase will be evaluated in terms of its potential impact on the site. Will each developmental phase be evaluated in terms of its impact on the other developmental phases and them on it?"

RESPONSE

Work is underway on the General Plan, but no completion date has been established. The General Land Use Plan is shown on figure 4. Project Stage Plans will cover about a five-year time span, and they will be developed as required during the project development period. If TVA determines that significant impacts may result which require additional environmental assessment, procedures similar to those used in determining the impacts discussed in this statement will be followed. The impact of each successive project stage plan will be evaluated in terms of its probable effect on each development phase.

COMMENT

"3. When will the further agreement with Boeing be entered into? Or has it already?"

RESPONSE

Negotiations between TVA and Boeing have been terminated.

COMMENT

"4. How will the ETDD regional plans (open space, Community Facility Land Use Plan, etc.) effect Timberlake and how will Timberlake effect them?
5. How will Timberlake complement the Development Strategy adopted by ETDD? What type of growth was predicted for the Loudon-Lenoir City area and the Sweetwater-Madisonville area? How does the proposed Timberlake Development relate to these growth strategies? All the Environmental Impact Statement says is that Timberlake is expected to complement the development strategy."

RESPONSE

TVA believes the discussion in the section, "East Tennessee Development District," adequately describes how Timberlake relates to the development strategy adopted by the ETDD for the 16-county region, which includes the Loudon-Lenoir City and Sweetwater-Madisonville areas. The ETDD has been involved in the review process of Timberlake planning for several years through staff contacts and participation on the Timberlake Advisory Board and with the Tellico Area Planning Council.

Shown below are the current baseline population projections by Census County Divisions for the Lenoir City, Loudon, Madisonville, and Sweetwater divisions.

Baseline Population Projections
By Census County Divisions
for Selected Locations

<u>Division</u>	<u>County</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
Lenoir City	Loudon	13,104	15,400	17,900	20,700
Loudon		6,558	6,500	6,600	6,700
Madisonville	Monroe	7,938	9,500	10,500	11,800
Sweetwater		7,534	7,800	8,200	8,700

Source: TVA, Economic Research Staff, based on county projections disaggregated by the Tennessee Social Science Advisory Committee from U.S. Water Resources Council, 1972 OBERS Projections, September 1972.

COMMENT

"6. In regards to the possible flood hazard, will TVA use standards established by the FIA? Will TVA use the 100-year flood elevation as the standard for first flood elevations in flood hazard areas?"

RESPONSE

The 100-year flood and related Federal Insurance Administration of the U.S. Department of Housing and Urban Development standards are recognized as the minimum safe level for regulatory purposes in flood hazard areas. TVA deed restrictions will usually apply a more stringent limitation

based upon a larger and less frequent flood event. In working with local governments to develop flood plain regulations in their jurisdictions, the 100-year flood is the minimum standard for which information is supplied.

COMMENT

"7. Are projected traffic counts available for those major highways on which the volume is expected to increase? These counts should be given to determine whether or not there will be any adverse impacts upon certain land uses. There are noise level criteria available for different land uses which could be compared with the projected noise levels for certain areas of Timberlake. This would show where the impacted areas are.

A closer look needs to be taken at the possible noise impact caused by the railroad. With the increase in industrial development throughout this area it is safe to assume that the number of trains operating in this area will also increase. Some type of noise calculations based on the number of projected night time operations needs to be done in order to determine their impact on the surrounding environment."

RESPONSE

No projected traffic counts are available for the major highways being relocated or newly constructed as part of the Tellico project. An average of 18 trains pass daily through the area including one which provides switching service. The through traffic is fairly evenly distributed over a 24-hour period. It is anticipated that many of the industries requiring rail service will be serviced by these existing trains. TVA believes it would be highly speculative to postulate the amount and specific schedule for moving goods by rail at this stage of the project planning. Railcar loading and switching at Timberlake will be localized within the major industrial areas shown on the General Land Use Plan (figure 4) and will not occur throughout the community. Given the localized nature of this activity, TVA will employ reasonable siting and mitigation measures to minimize noise impacts. TVA plans to make background noise measurements after Tellico Reservoir is filled and to undertake more detailed noise studies to guide development as plans are further developed. Such noise evaluations will be conducted in full cognizance of HUD Circular 1390.2.

COMMENT

"8. If HUD-sponsored housing projects are planned for future development, HUD Handbook 1390.2 will be applicable in evaluating the noise situation,"

RESPONSE

TVA will utilize appropriate techniques in evaluating possible noise impacts, including HUD Handbook 1390.2.

COMMENT

"9. The Environmental Impact Statement states 'There are no existing fire protection services available in the Timberlake area. While no specific arrangements have been made, the developer is expected to provide or sponsor. . . .' To protect the area from possible adverse impacts of a major fire it would seem necessary for TVA to provide in their plans for fire protection service at the earliest stages of development as well as later."

RESPONSE

TVA agrees with the Department of Housing and Urban Development that early planning should identify fire protection service providers. Monroe County, in cooperation with TVA, is presently planning a Volunteer Rural Fire Protection program for the county. That portion of Timberlake in the county would be serviced by fire protection units located in the Vonore area.



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

In Reply Refer To:
PEP ER-74/1485

FEB 5 1975

Dear Dr. Krenkel:

This is in regard to your letter of November 29, 1974, requesting the Department of the Interior to review and comment on your draft environmental statement on the Timberlake New Community. Accordingly, we have reviewed the statement and offer the following comments for your consideration.

GENERAL COMMENTS

Overall, we find that the statement addresses most of the general requirements set forth in the National Environmental Policy Act of 1969. However, there are several areas in the statement where more information is necessary to more adequately understand the proposed project as well as assess the ensuing impacts. For example, without further detail concerning the comprehensive district-wide plan or the development project plans between TVA and Boeing, it is difficult to infer what type of development will occur. Further, without this knowledge, it is extremely difficult to assess the ensuing environmental impacts of the New Community of Timberlake and its relationship to the total regional environment.

Additionally, we find that potential long-term impacts on water resources have been treated in a very general way. And, it is not possible to evaluate the effects of the watershed system, the stormwater system, or the solid waste disposal system (p. 34-37), until more specific details are presented. We suggest that the statement address more of these particulars or that separate detailed statements may be needed as decisions are reached concerning specific systems to be used. Other specific examples which need to be addressed in the final environmental statement are discussed below.



Save Energy and You Serve America!

SPECIFIC COMMENTS

Recreation: On page 3 (third paragraph) it is stated that public and commercial recreational opportunities planned for Timberlake should complement efforts to reduce demand for high-density recreation activities within the Great Smoky Mountains National Park and the Cherokee National Forest. We believe that while Timberlake may provide camping areas, nature and hiking trails, and possibly some hunting and fishing, these activities at Timberlake would not provide opportunity for the same type experience or recreational activity as the national forest or national park would provide, and consequently would not divert tourists from these areas. Furthermore, Timberlake would not provide trout fishing, the same quality hunting or hiking, nor any water-based recreational activity associated with a free-flowing river or stream. On the last point, we note that the new dam under construction may actually compound the problem of overcrowding on the streams of the national park as the reservoir swallows up many of the trout streams around Timberlake.

On page 40, it is stated a significant portion of the project (3,700 acres, or 23 percent of the total) "will be devoted to the development of public and private recreational facilities." This figure sounds impressive, but the overall recreation picture cannot be assessed without additional figures that break this lump sum into the various types of facilities which will be developed. For example, how much of this 23 percent figure represents the acreage allotted to the construction of private cabins and resorts which would not be open to the general public or the eventual community at large?

Transportation: The impact of the proposed new transportation facilities, especially the construction of Highway 72 and the Tellico Parkway within the present boundary of the Tellico Project, should be considered more fully in the statement. A single transportation map combining the relevant features of Figure 12 and Figure 15, with enough detail to include the location of the 13 planned bridges, is needed for review of the entire transportation picture.

We note on page 3 (second paragraph) that a comprehensive pathway system will be developed for Timberlake. It is not clear as to whether bicycle paths are included under the term "pathways."

The statement does mention bikeways on page 27; however, it is not clear whether these routes will be part of the initial Timberlake development plan or will be included with a later public transportation system. We believe that a comprehensive bicycle plan is essential, both for origin-destination travel and for recreational purposes.

Historical and Cultural Features: On page 13, it is noted that the National Register of Historic Places has been consulted. However, there is no indication the State Historic Preservation Officer for Tennessee has been consulted as required in Section 800.4 of the Advisory Council on Historic Preservation's "Procedures for the Protection of Historic and Cultural Properties" (F. R. January 25, 1974). His response should be included in the final statement. The National Register lists 10 places in Loudon and Monroe Counties and one natural landmark (Craighead Caverns) in Monroe County. New Community Objectives, page 7, states that the open space, recreation, natural beauty and cultural resources are detailed in Section 800. The environmental statement should contain required information upon which to determine if in fact compliance has occurred.

For example, all cultural resources in the area which may be influenced by the project need to be evaluated to determine if they are eligible for nomination to the National Register of Historic Places. Criteria for eligibility are provided in Section 800.10. Agency responsibilities in the evaluation and nomination of the sites are found in Section 800.4(a)(2).

If it is determined that sites meeting the criteria are within the influence of the project, the statement should indicate awareness of this and note progress of surveys of the affected area in compliance with Section 2(a) of Executive Order 11593.

We note that reference is made to cultural resource surveys made as part of the Tellico Project. However, the Timberlake New Community Project statement contains no information on the extent and results of the surveys in relation to the Timberlake project of a potential residential industrial community of 30,000 population in a heretofore rural environment may well reach beyond the physical land and water boundaries of the proposed action. The statement should contain required data on surveys and evaluations to support the impact conclusion as noted on page 41, paragraph

number 5, that: "Timberlake is not expected to have an adverse effect on the historic and cultural heritage of the area. On the contrary, Timberlake will provide opportunities to ensure proper recognition, appropriate preservation, and utilization of this heritage."

Wastewater Treatment: We note that the wastewater treatment plants will provide secondary treatment plus chlorination before discharged into Tellico Reservoir. We assume that chlorine levels will be kept at the lowest level practicable as chlorine is a potent toxic material to organisms in the freshwater community.

Wildlife: On page 41, the statement is made that: "The increased number of people and their activity will cause shifts in the population of wildlife and reduction in their numbers on the site." It should be noted in the statement that animals do not simply move into suitable habitat in some other location as that habitat would already be occupied. And, that competition for available food and shelter would be intensified. Further, some of the organisms would be unable to survive the intensive competition and would perish.

Vegetation: On page 24, the draft statement indicates that approximately two-thirds of the 10,000 acres of forested lands within the area will be directly affected by the proposed action. The relative importance of this permanent reduction in the timber growing base, however, is not specified. If the land base is not currently under an intensive forest management program and is not or is not expected to contribute forest products to local wood using industry, the loss of this timber production base may be insignificant.

Intensive development may also cause microclimatic and microbiotic changes which will inherently lead to alteration of the residual vegetative communities, both within and on the periphery of the area. Introduction of exotic or obnoxious plant species, either intentionally or unintentionally, may also cause major or minor impacts to the "natural" environment.

Industrial Development Objectives: On page 6, it is stated that: "Unified management will permit orderly development, which should demonstrate that it is possible for large-scale industrial development to take place and be environmentally compatible with the residential and recreational activities." However, we find that the statement does not present any discussion on how the "large-scale industrial development" will be controlled in such a manner

as to be "environmentally compatible." The statement should contain information on specific restrictions which will be applied to industrial development or if such restrictions are not possible then an assurance that separate environmental impact statements will be required on each proposed action which may not be compatible with residential and recreational resources.

Further, with the forecast that . . . "new industrial employment opportunities could provide a net addition of 4,000 to 6,000 jobs during a 20-year development period." And, that: "Some 4,000 acres of sites served by highways, rail, and barge facilities will be available in the industrial area." We suggest that the statement address the possible impacts of the proposed project on the adjacent Great Smoky National Park, particularly since the industrial development is in a heretofore rural environment.

Minerals: With the exception of zinc, mineral resources are adequately described in the statement. On page 10, the notation ". . . a very minor zinc deposit underlies most of the Timberlake site" could be misleading. Department of Interior files show that a zinc ore body along Fork Creek near Eve Mills has been partially outlined by drilling by the American Zinc Company with an estimated 400,000 tons of ore containing 3.2 percent zinc. Several hundred acres of property overlying this occurrence are currently under option to United States Borax Company. This company has conducted additional exploration but the results have not been made public. The known deposit lies outside the TVA project but the mineralization may extend into the project area. And, we suggest that the final statement should clarify the size and grade of this occurrence and consider the impact the proposal might have on future mineral development in this area.

Irreversible and Irretrievable Commitments of Resources: Commitment of the 16,000 acre site to community development will essentially result in the irreversible loss of timber and agricultural production potential. Wildlife habitat loss is also irreversible and will result in an irretrievable loss of some wildlife.

Although private and public recreational facilities will be made available under the development concept, full recreational potential cannot be achieved since much of the area will be dedicated to the community and industrial complexes. Some recreational opportunities are, therefore, foregone which constitutes an irretrievable resource loss.

Alternatives: (C. Public Recreational Development). It is stated that: "This alternative would offer substantially the same type of recreational opportunities that are presently available on the 1.1 million acres of public lands in the Great Smoky Mountains National Park and the Cherokee National Forest." We believe that the suggested recreational development around the reservoir would complement recreational activities of Great Smoky Mountains National Park, but should not be considered the same type. Differences in elevation, land configuration, scenery, acreage, flora, and fauna preclude such a comparison. And, we suggest that the statement should be changed accordingly.

We appreciate the opportunity to review and comment on this statement and hope that our remarks will be of assistance to you in preparing the final environmental statement.

Sincerely yours,



Deputy Assistant Secretary of the Interior

Dr. Peter A. Krenkel
Director of Environmental Planning
Tennessee Valley Authority
Chattanooga, Tennessee 37401

TVA Responses to Comments from
United States Department of the Interior

COMMENT

"Overall, we find that the statement addresses most of the general requirements set forth in the National Environment Policy Act of 1969. However, there are several areas in the statement where more information is necessary to more adequately understand the proposed project as well as assess the ensuing impacts. For example, without further detail concerning the comprehensive district-wide plan or the development project plans between TVA and Boeing, it is difficult to infer what type of development will occur. Further, without this knowledge, it is extremely difficult to assess the ensuing environmental impacts of the New Community of Timberlake and its relationship to the total regional environment."

RESPONSE

Section III, "Relationship to Regional Goals and Objectives," concisely summarizes the complementary relationship between plans for Timberlake and specific goals and objectives of the Tellico Area Planning Council, Blount, Loudon, and Monroe Counties, and the East Tennessee Development District. Those persons interested in researching specific details of various parts of the plans and/or goals and objectives should read the exhibits referenced in notes 39 through 41 of this statement. If the organizational entity concerned is unable to make a copy available, TVA's file copy may be made available for review.

COMMENT

"Additionally, we find that potential long-term impacts on water resources have been treated in a very general way. And, it is not possible to evaluate the effects of the watershed system, the stormwater system, or the solid waste disposal system (p. 34-37), until more specific details are presented. We suggest that the statement address more of these particulars or that separate detailed statements may be needed as decisions are reached concerning specific systems to be used. Other specific examples which need to be addressed in the final environmental statement are discussed below."

RESPONSE

Specific proposals for stormwater and solid waste management systems will be developed during preparation of the detailed first development stage plans for Timberlake. See the rewritten Section Solid Waste on page 37 and TVA's response to comments from the Tennessee Department of Public Health, Division of Solid Waste Management.

COMMENT

"Recreation: On page 3 (third paragraph) it is stated that public and commercial recreational opportunities planned for Timberlake should complement efforts to reduce demand for high-density recreation activities within the Great Smoky Mountains National Park and the Cherokee National Forest. We believe that while Timberlake may provide camping areas, nature and hiking trails, and possibly some hunting and fishing, these activities at Timberlake would not provide opportunity for the same type experience or recreational activity as the national forest or national park would provide, and consequently would not divert tourists from these areas. Furthermore, Timberlake would not provide trout fishing, the same quality hunting or hiking, nor any water-based recreational activity associated with a free-flowing river or stream. On the last point, we note that the new dam under construction may actually compound the problem of overcrowding on the streams of the national park as the reservoir swallows up many of the trout streams around Timberlake."

RESPONSE

The draft does not suggest that Timberlake recreational opportunities will divert tourists from dispersed activities such as trout fishing, hunting, and use of nature and hiking trails within the Great Smoky Mountains National Park and the Cherokee National Forest, but rather that Timberlake should "complement efforts to reduce the demand for high-density recreation activities" within the park and forest.

COMMENT

"On page 40, it is stated a significant portion of the project (3,700 acres, or 23 percent of this total) 'will be devoted to the development of public and private recreational facilities.' This figure sounds impressive, but the overall recreation picture cannot be assessed without additional figures that break this lump sum into the various types of facilities which will be developed. For example, how much of this 23 percent figure represents the acreage allotted to the construction of private cabins and resorts which would not be open to the general public or the eventual community at large?"

RESPONSE

Table 34 in Appendix B has been included to illustrate the expected relative comparison of acreage requirements for selected recreational activities at Timberlake which would accommodate the projected demand.

COMMENT

"Transportation: The impact of the proposed new transportation facilities, especially the construction of Highway 72 and the Tellico Parkway within the present boundary of the Tellico Project, should be considered more fully in the statement. A single transportation map combining the relevant features of Figure 12 and Figure 15, with enough detail to include the location of the 13 planned bridges, is needed for review of the entire transportation picture."

RESPONSE

Figure 15 shows the relevant features of a single transportation map. The construction of Highway 72, the Tellico Parkway, and the 13 bridges are being constructed as part of the Tellico project and not as part of the proposed Timberlake Project.

COMMENT

"We note on page 3 (second paragraph) that a comprehensive pathway system will be developed for Timberlake. It is not clear as to whether bicycle paths are included under the term 'pathways.' The statement does mention bikeways on page 27; however, it is not clear whether these routes will be part of the initial Timberlake development plan or will be included with a later public transportation system. We believe that a comprehensive bicycle plan is essential, both for origin-destination travel and for recreational purposes."

RESPONSE

Policy, plans, and criteria for both an interim and long-term open space system within Timberlake are currently being developed by TVA. Bikeways will be included as part of the system.

COMMENT

"Historical and Cultural Features: On page 13, it is noted that the National Register of Historic Places has been consulted. However, there is no indication the State Historic Preservation Officer for Tennessee has been consulted as required in Section 800.4 of the Advisory Council on Historic Preservation's 'Procedures for the Protection of Historic and Cultural Properties' (F. R. January 25, 1974). His response should be included in the final statement. The National Register lists 10 places in Loudon and Monroe Counties and one natural landmark (Craighead Caverns) in Monroe County. New Community Objectives, page 7, states that the open space, recreation, natural beauty and cultural resources are detailed in Section 800. The environmental statement should contain required information upon which to determine if in fact compliance has occurred.

For example, all cultural resources in the area which may be influenced by the project need to be evaluated to determine if they are eligible for nomination to the National Register of Historic Places. Criteria for eligibility are provided in Section 800.10. Agency responsibilities in the evaluation and nomination of the sites are found in Section 800.4 (a) (2).

If it is determined that sites meeting the criteria are within the influence of the project, the statement should indicate awareness of this and note progress of surveys of the affected area in compliance with Section 2 (a) of Executive Order 11593.

[and]

We note that reference is made to cultural resource surveys made as part of the Tellico Project. However, the Timberlake New Community Project statement contains no information on the extent and results of the surveys in relation to the Timberlake project of a potential residential industrial community of 30,000 population in a heretofore rural environment may well reach beyond the physical land and water boundaries of the proposed action. The statement should contain required data on surveys and evaluations to support the impact conclusion as noted on page 41, paragraph number 5, that: 'Timberlake is not expected to have an adverse effect on the historic and cultural heritage of the area. On the contrary, Timberlake will provide opportunities to ensure proper recognition, appropriate preservation, and utilization of this heritage.'

RESPONSE

The Tennessee Historic Preservation Officer has been conducted numerous times on matters related to this proposal during the course of planning for the Tellico project and the preparation of the related environmental statement. TVA has conducted and/or contracted for extensive historic and cultural research relating to features within the three-county area

surrounding Timberlake. Table 35 and figure 11 have been included in the statement to illustrate this point and the section, Historical and Cultural Features, page 13, has also been supplemented.

As part of TVA's continuing research effort related to the Timberlake area, in 1969 TVA invited the Tennessee Historical Commission to evaluate buildings and sites of historic and/or architectural significance on the Timberlake site and offer opinions and suggestions concerning preservation. The historical commissions of Loudon, Monroe, and Blount Counties assisted in the survey. The Hiwassee Chapter of the Daughters of the American Revolution and the members of the Board of the Fort Loudoun Association were also contacted and provided useful historical information.

Also in 1969, TVA contracted with professional writers, Carson and Alberta Brewer of Norris and Knoxville, Tennessee, to research and prepare a written history of the Little Tennessee River Watershed, including parts of northwest Georgia, western North Carolina, and southeastern Tennessee. In conducting their study, the Brewers researched the limited available written history; searched county, state, national, and colonial records; went through the private and historical collections which exist; and personally visited the areas to interview many individuals. An extensive manuscript has been prepared and is available to the public at the TVA Technical Library, Knoxville, Tennessee. The Brewers' research for the first time, collects the history of this diversified, yet unique, area and analyzes the historical and natural forces which contribute to its uniqueness. The original manuscript gives particular attention to the Tellico and Timberlake projects. A somewhat shortened version of the manuscript has been published by the East Tennessee Historical Society. Dr. James Patrick, School of Architecture, University of Tennessee, Knoxville, was retained by TVA in 1973 to act as an architectural consultant on various TVA projects. Dr. Patrick and TVA have examined every dwelling, farm buildings, and other structures on the Timberlake site which was acquired by TVA during construction of the Tellico project. From his onsite inspections and the historical background of each structure provided by TVA, Dr. Patrick made recommendations concerning the disposition of each structure. Certain buildings were designated to be measured and photographed before removal, others to be preserved, and, in some cases, certain structural features such as hardware to be removed and preserved in the collection of local historical samples maintained

by The University of Tennessee's School of Architecture. TVA has worked closely with the State Historical Liaison Officer in determining which properties should be preserved. TVA has carried out the recommendations. In addition to supporting Dr. Patrick's work, TVA has cooperated with University of Tennessee faculty and students to study and record typical examples of house patterns in the area, and measure, research, and record such features as bridges and other structures which are being removed from the project area during construction of the Tellico project. All of this information is available at the School of Architecture for use of students studying local architecture and some phases of social anthropology.

In the spring of 1973, TVA asked Mr. John L. Cotter, then Archaeologist, U. S. Department of Interior, for an opinion of the Chota site, location of a former Cherokee capital, and related sites. On the recommendations of Mr. Cotter and others, TVA contracted with Mr. William D. Hershey, research consultant of Philadelphia, to search available historical records to determine (1) the significance of Chota in Cherokee, Indian, and American history; (2) the physical and social characteristics of Chota as recorded by contemporary observers; and (3) the kinds of activities which occurred in Chota that could be reproduced for visitors as illustrations of authentic Cherokee life. Mr. Hershey has examined papers and records at the Huntington Library (San Marino, CA), the Clements Library (Univ. of Michigan), the Draper Collection (Madison, WI), the Newberry Library's Payne and Ross Collections (Chicago), the historical collections located in New England, New York, and Philadelphia, the archives and libraries in Washington and the state archives and historical collections in Virginia, North Carolina, and South Carolina, plus other smaller depositories in this country. He is attempting to obtain certain information from French private collections about the physical descriptions of Chota and other Cherokee towns in the Little Tennessee Valley. He is also recording any information on Fort Loudoun and the Tellico Blockhouse which is discovered. Upon completion of Mr. Hershey's work, TVA will have determined, as far as possible, all information known to exist on Chota as a place of human habitation. This information will then be coordinated with archaeological findings at Chota to establish the type, scope, and characteristics for a reconstruction of some of the typical elements of the village, including ceremonial and other day-to-day activities.

As a result of TVA-sponsored research, the East Tennessee Historical Society has presented three programs to the public about the Little Tennessee Valley since 1973: (1) Jesse C. Mills, TVA Chief Librarian, lectured on the history and significance of Tellico Blockhouse; (2) Carson and Alberta Brewer gave an analysis of their methods of research and its results as related to their forthcoming history; and (3) Richard Polhemus, Archaeological Field Supervisor for the Tellico Blockhouse excavation, presented a summary of his findings during the excavation and their relation to the known history of the Blockhouse. Publications of these works are planned.

TVA has sponsored extensive archaeological investigations in the Timberlake areas as a result of construction of the Tellico project. TVA is currently concentrating on intensive field archaeological investigations on lands subject to inundation in 1977, but it is planned prior to completion of this current archaeological program to conduct an extensive survey of all properties acquired by TVA for the Tellico project which will include the Timberlake site. The statement regarding impact made in the section, "Historic Values, Archaeological Restoration and Protection," of the draft statement reflected the fact that TVA is committed to giving full consideration to the historic and cultural features of the Timberlake site in planning, design, and construction activities. These features will be integrated into compatible relationships with planned developments. TVA believes that changes to the human environment through planned social and economic development, does not necessarily doom existing natural and physical to adversity. Careful planning can minimize possible adverse impacts. The nature of the historic and cultural sites on the Timberlake site are such that their importance and in most cases their continued existence should be enhanced by the overall planning and development approach to be pursued by TVA.

COMMENT

"Wastewater Treatment: We note that the wastewater treatment plants will provide secondary treatment plus chlorination before discharged into Tellico Reservoir. We assume that chlorine levels will be kept at the lowest level practicable as chlorine is a potent toxic material to organisms in the freshwater community."

RESPONSE

For all secondary facilities included in the interim wastewater treatment system and all advanced treatment facilities included in the permanent system, the effluent chlorine levels will be maintained at the lowest practicable concentrations consistent with water quality standards promulgated by the Tennessee Department of Public Health and with requirements respecting new sources promulgated by the U.S. Environmental Protection Agency. TVA will conduct a water quality monitoring program in Tellico Reservoir that will reveal the effectiveness of effluent controls.

COMMENT

"Wildlife: On page 41, the statement is made that: 'The increased number of people and their activity will cause shifts in the population of wildlife and reduction in their numbers on the site.' It should be noted in the statement that animals do not simply move into suitable habitat in some other location as that habitat would already be occupied. And, that competition for available food and shelter would be intensified. Further, some of the organisms would be unable to survive the intensive competition and would perish."

RESPONSE

This is a valid point and the second paragraph of section, "Adverse Environmental Effects. . .," on page 41 has been rewritten to reflect this opinion.

COMMENT

"Vegetation: On page 24, the draft statement indicates that approximately two-thirds of the 10,000 acres of forested lands within the area will be directly affected by the proposed action. The relative importance of this permanent reduction in the timber growing base, however, is not specified. If the land base is not currently under an intensive forest management program and is not or is not expected to contribute forest products to local wood using industry, the loss of this timber production base may be insignificant."

RESPONSE

TVA agrees with the Department of Interior that the loss of timber production base may be insignificant. The section, "Flora," on page 23 has been rewritten to reflect this opinion.

COMMENT

"Intensive development may also cause microclimatic and microbiotic changes which will inherently lead to alteration of the residual vegetative communities, both within and on the periphery of the area. Introduction of exotic or obnoxious plant species, either intentionally or unintentionally, may also cause major or minor impacts to the 'Natural environment.'"

RESPONSE

TVA recognizes that development of Timberlake will inherently lead to alteration of certain existing vegetative communities but believes the change in the aggregate need not necessarily be adverse in nature.

COMMENT

"Industrial Development Objectives: On page 6, it is stated that: 'Unified management will permit orderly development, which should demonstrate that it is possible for large-scale industrial development to take place and be environmentally compatible with the residential and recreational activities.' However, we find that the statement does not present any discussion on how the 'large-scale industrial development' will be controlled in such a manner as to be 'environmentally compatible.' The statement should contain information on specific restrictions which will be applied to industrial development or if such restrictions are not possible then an assurance that separate environmental impact statements will be required on each proposed action which may not be compatible with residential and recreational resources."

RESPONSE

Since it is an objective of the Timberlake project that the industrial development be compatible with residential and recreational resources, TVA recognizes that were it to undertake industrial development which was significantly incompatible with such resources, a supplemental environmental statement would be required. Further, it is believed the procedural commitments made by TVA in Section IV, "Program Management," offers an appropriate method for ensuring that Timberlake is developed to minimize any undesirable effects of adjoining land uses, including industrial development.

COMMENT

"Further, with the forecast that . . . 'new industrial employment opportunities could provide a net addition of 4,000 to 6,000 jobs during a 20-year development period.' And, that: 'Some 4,000 acres of sites served by highways, rail, and barge facilities will be available in the industrial area.' We suggest that the statement address the possible impacts of the proposed project on the adjacent Great Smoky National Park, particularly since the industrial development is in a heretofore rural environment."

RESPONSE

The interrelationship of the Timberlake project and the Great Smoky Mountains National Park is discussed on page 21. Meeting the demand opportunities generated by the residents in Timberlake for various recreation opportunities is to be provided for in the planned recreation and open space system concept within the community. Additional demand for recreation experiences unique to the park by the approximately 30 to 40 thousand people expected to be associated with Timberlake employment opportunities over the 20-year development period is judged to be insignificant in comparison to the estimated total park visitation of 14 million people by 1990.

COMMENT

"Minerals: With the exception of zinc, mineral resources are adequately described in the statement. On page 10, the notation '. . . a very minor zinc deposit underlies most of the Timberlake site' could be misleading. Department of Interior files show that a zinc ore body along Fork Creek near Eve Mills has been partially outlined by drilling by the American Zinc Company with an estimated 400,000 tons of ore containing 3.2 percent zinc. Several hundred acres of property overlying this occurrence are currently under option to United States Borax Company. This company has conducted additional exploration but the results have not been made public. The known deposit lies outside the TVA project but the mineralization may extend into the project area. And, we suggest that the final statement should clarify the size and grade of this occurrence and consider the impact the proposal might have on future mineral development in this area."

RESPONSE

Intermittant geochemical studies and exploration by private interests have taken place during the past 25 years in the Timberlake area. The only known available public information in zinc ore reserved in the area is

contained in government reports since results of exploration by private companies are confidential. The quality and quantity of ore defined in these public reports are marginal under current market conditions and not sufficient to justify establishment mining and milling facilities. If mining were ever attempted at the Eve Mills' prospect (about two miles west of the Timberlake site) and the underground workings were to extend beneath the project area, the depth of operations would be great enough that Timberlake should have no adverse impact on mining of the ore.

COMMENT

"Irreversible and Irretrievable Commitments of Resources: Commitment of the 16,000 acre site to community development will essentially result in the irreversible loss of timber and agricultural production potential. Wildlife habitat loss is also irreversible and will result in an irretrievable loss of some wildlife."

RESPONSE

The Department of the Interior's comment is pertinent. Recognition of these issues by TVA are noted in the section, "Adverse Environmental Effects . . .," on page 41.

COMMENT

"Although private and public recreational facilities will be made available under the development concept, full recreational potential cannot be achieved since much of the area will be dedicated to the community and industrial complexes. Some recreational opportunities are, therefore, foregone which constitutes an irretrievable resource loss."

RESPONSE

TVA disagrees with the Department of Interior that full recreational potential of the site cannot be achieved under the Timberlake concept. The amount of land used for a single-purpose activity is not necessarily the primary factor in determining what constitutes an irretrievable loss. Certainly in attempting to provide a balanced approach to developing the resources of an area, tradeoff decisions and choices must be made where studies indicate land is equally suitable for more than one type of use. Narrowly interpreted, this could be construed as an "irretrievable loss"

to those championing one type of activity. TVA believes any loss of this nature in regard to the "full recreational potential" of Timberlake is insignificant.

There are many factors which determine the "highest and best use" of a land base, such as location, market demand, and site suitability. As stated on page 6, TVA has completed an overview analysis of the suitability of the Timberlake site for alternative land use possibilities. Those land areas considered to be most suitable for active and passive recreation and conservation type activities have been designated for these purposes and are identified on figure 4. The long-range comprehensive planning approach being used for Timberlake has the flexibility to allow adjustments in the General Land Use Plan to ensure a variety of quality recreational facilities and activities, capable of accommodating varying intensities of use, are provided so that any "loss" should be negated.

As presently planned, Timberlake will offer comparable recreational opportunities to the single-purpose alternatives described in the section, "Public and Commercial Recreational Development," and it will provide a wider range of recreational opportunities than the single-purpose alternatives described in the section, "Public Recreational Development" described on page 43.

COMMENT

"Alternatives: (C. Public Recreational Development). It is stated that: 'This alternative would offer substantially the same type of recreational opportunities that are presently available on the 1.1 million acres of public lands in the Great Smoky Mountains National Park and the Cherokee National Forest.' We believe that the suggested recreational development around the reservoir would complement recreational activities of Great Smoky Mountains National Park, but should not be considered the same type. Differences in elevation, land configuration, scenery, acreage, flora, and fauna preclude such a comparison. And, we suggest that the statement should be changed accordingly."

RESPONSE

We agree. Although many of the activities under this alternative are of the same type as those available in the Great Smoky Mountains National Park and the Cherokee National Forest, the recreational experience may not be strictly comparable because of the differences noted by the Department of Interior. The section, "Public Recreational Development" on page 43 has been rewritten to reflect this viewpoint.

Tennessee Department of Conservation

Division of Planning & Development

RAY BLANTON - GOVERNOR
B.R. ALLISON - COMMISSIONER

2611 West End Ave. Nashville, Tennessee 37203

(615) 741-1061

WALTER L. CRILEY - DIRECTOR

May 14, 1975

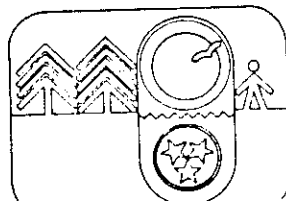
Mr. Stephen Norris
Grant Review Coordinator
Office of Urban & Federal Affairs
108 Parkway Towers Building
Nashville, Tennessee 37219

Re: Timberlake New Community
Draft Environmental Statement
Tennessee Valley Authority

Dear Mr. Norris:

Comments on the referenced Environmental Statement were due February 26, 1975. The Department of Conservation encountered problems in its review which have delayed our response. Nevertheless we are now forwarding the following concerns, questions and comments:

1. Our Division of Geology raised the question of a high grade marble underlying the site and this development's impact upon the potential economy of the area. This marble is being mined in the area at present. Should not this resource be discussed in the Statement?
2. The Division of Forestry suggests that future planning consider the importance of forest management for the forested portions of Timberlake properties.
3. The proposed overall residential density of 5 units per acre seems to be excessive if in fact a quality residential environment is desired. Such a density would reflect the typical suburban development and does not seem innovative in terms of "high quality living."



Mr. Stephen Norris
Page 2
May 14, 1975

4. Section III states that 4,000 acres will be devoted to public and private recreational facilities while the Environmental Impact Section II maintains 3,700 acres will be allocated to public and private recreation development. A difference in public vs. private facilities is needed (e.g. acreages, location, type of facilities, etc.).

5. It is stated that the proposal will complement efforts to reduce demand within the Great Smoky Mountains National Park and Cherokee National Forest. It is doubtful that reservoir based recreation such as Timberlake will reduce visitation to the Park or National Forest. Reservoir based recreation opportunities and activities are plentiful in Tennessee. The Great Smoky Mountain National Park, however, will continue to maintain a unique integrity of specific interest to visitors, with or without the Timberlake project.

6. Section IV Program Management, C. Public Control of Land Base.

The discussion should specify how TVA will insure maintenance of the open space concept following transmittal of these lands to the private sector.

7. Figure 4. Conceptual Land Use Plan. Two significant historical sites, Bowman House and the Tipton House and Cemetery are designated within permanent housing sectors. Should not these historic sites be included within or buffered by open space?

8. The Two Sections - Relationship Between Local, Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long Term Productivity and Irreversible and Irrecoverable Commitments of Resources that Would be Involved in the Proposed Action Should it be Implemented are not addressed sufficiently. We would like to see a discussion of environmental tradeoffs, expected increase in recreational use over time, and irreversible commitments of social and economic factors.

9. The Discussion of Alternatives to the Proposed Action does not include the alternate means of meeting the project purposes nor different levels of development.

10. The recent announced withdrawal of the Boeing Company from a partnership with TVA now raises the question of the implementation of the Timberlake project. We believe a supplement to the environmental statement resulting from this action would be warranted.

11. The statement seems to be noticeably weak in indicating the economics of the project, that is, how the funding is to be provided



Mr. Stephen Norris
Page 3
May 14, 1975

to carry out the project concepts. With the withdrawal of the Boeing Company and the failure of the federal government to adequately fund any new town developments, it seems that the matter of financing this project to completion needs to be strongly addressed in some form. The environmental statement may or may not be the proper vehicle. However, a 20-year development program as anticipated would need strong financing. Should this financing not develop on a reasonable timetable, the environmental consequences could be significant.

12. There are several assumptions built into the project concept which may or may not materialize. One is the state park first mentioned on page 3. Thus there are many intangibles, and if some of these do not materialize for whatever reason, the project could be in serious difficulty.

13. The original concept of the Tellico project was that Timberlake was a new community to be located on a specific portion of the reservoir. It now appears that the concept of Timberlake has been altered to encompass the entire 16,500 acre reservoir and surrounding 16,000 acres of land. Some discussion of the changing concept from a limited new community to a total reservoir development would seem to be in order.

14. The section on alternatives to the proposed action beginning on page 42 is confusing in that all the alternatives being considered are also a part of the Timberlake concept as set forth in the statement. That is, Timberlake will consist of industrial development, both public and commercial recreation and residential subdivision. It is difficult to consider the alternatives to the proposed action when they in fact seem to be part of the Timberlake project.

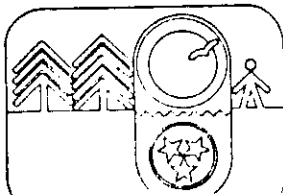
15. Finally, on a much less serious note, we were somewhat amused by the last sentence on page 25. Are we to assume that the southern bald eagle which is "only occasionally sighted" in the area and will now become a "less frequent visitor" will in fact never be seen again!

We thank you for the opportunity to review and comment.

Sincerely,

Walter L. Criley
Walter L. Criley

y



TVA Responses to Comments from
Tennessee Department of Conservation

COMMENT

"1. Our Division of Geology raised the question of a high grade marble underlying the site and this development's impact upon the potential economy of the area. This marble is being mined in the area at present. Should not this resource be discussed in the Statement?"

RESPONSE

Section, "Minerals" on page 10 has been rewritten to include a discussion on marble. The marble underlying the Timberlake site is similar to that quarried elsewhere in the area and such deposits are plentiful throughout east Tennessee. Much of the marble in the Timberlake area is fractured and not particularly well suited for quarrying as dimension stone. Marble deposits on the site have no unusual economic potential and with the decline of the industry in recent years, there appears to be little encouragement for establishment of major quarrying operations.

COMMENT

"2. The Division of Forestry suggests that future planning consider the importance of forest management for the forested portions of Timberlake properties."

RESPONSE

Detailed planning for an open space system is now in progress. This plan will include a forest management program for forested areas within Timberlake.

COMMENT

"3. The proposed overall residential density of five units per acre seems to be excessive if in fact a quality residential environment is desired. Such a density would reflect the typical suburban development and does not seem innovative in terms of 'high quality living.'"

RESPONSE

TVA does not believe an average residential density of about five units per gross acre of residential land is considered "excessive" in the

planning field. Residential density is but one of the many factors of community planning and design which contribute to "high quality living." TVA intends to develop a quality residential environment in Timberlake by combining a relatively low-average residential density with a combination of basic amenities: privacy, convenience of access, usable open space, recreational facilities, safety, beauty, and variety of housing types and arrangements. The provision of varying densities when combined with the above-mentioned amenities, will in fact, create a better total neighborhood environment which contributes to "high quality living."

COMMENT

"4. Section III states that 4,000 acres will be devoted to public and private recreational facilities while the Environmental Impact Section II maintains 3,700 acres will be allocated to public and private recreation development. A difference in public vs. private facilities is needed (e.g., acreages, location, type of facilities, etc.)."

RESPONSE

The type of facilities expected to be included in the public and/or private recreational developments are described on pages 3 and 40 of this statement. Page 3 has been revised to show the correct figure of 3,700 acres. These facilities and associated activities will be located throughout Timberlake generally in the locations shown on figure 4. Table 34 illustrates a possible acreage allocation for selected recreational facilities and the probable development sector participation.

COMMENT

"5. It is stated that the proposal will complement efforts to reduce demand within the Great Smoky Mountains National Park and Cherokee National Forest. It is doubtful that reservoir-based recreation such as Timberlake will reduce visitation to the Park or National Forest. Reservoir-based recreation opportunities and activities are plentiful in Tennessee. The Great Smoky Mountain National Park, however, will continue to maintain a unique integrity of specific interest to visitors, with or without the Timberlake project."

RESPONSE

As discussed on page 21 of the draft, the National Park Service invited TVA and other Federal agencies, state agencies, including the Tennessee Department of Conservation, and local planning agencies in North Carolina and Tennessee to join a task force to identify regional activities and goals for consideration in the development of a new master plan for the Great Smoky Mountains National Park. The task force has prepared a set of preliminary regional recreation guidelines for the park and the 13 surrounding counties most directly affected. The consensus of the task force is that the greatest potential for reducing extensive use pressures within the park while fulfilling public recreation needs lies in the provision of diversified recreation opportunities in the surrounding region, and that demand for high-density recreation areas could be best met on area reservoirs, including the recreational related opportunities planned for the shorelands of the Tellico Reservoir.

Preliminary results of a comprehensive study incorporating interviews with visitors to the Great Smoky Mountains National Park and the surrounding 13-county region indicate that, in the visitors' minds, the park and the surrounding region are a single vacation entity. To quote from the study consultant's report, "Though most visitors seem to look to the park alone to provide the nature experience of their trip, they look to the surrounding region for things the park does not provide For most visitors, then, the facilities/attractions of the region outside the park are necessary complements to the nature appreciation experience they expect to find inside the park. Both are essential in the vacation experience Thus, in planning, the park and region must always be considered together. Programs/facilities/services, etc., planned for one will affect the other."

(Amusement Recreation Marketing Services, Inc. Visitor Sampling Survey, Great Smoky Mountains National Park, Interim Analytic Report, April, 1975.)

While TVA agrees that the park will remain an area of unique interest to the visitor, it believes recreational related development at Timberlake will complement efforts to reduce demand for high-density recreation development within the Great Smoky Mountains National Park and the Cherokee National Forest.

COMMENT

"6. Section IV Program Management, C. Public Control of Land Base. The discussion should specify how TVA will ensure maintenance of the open space concept following transmittal of these lands to the private sector."

RESPONSE

As presently conceived, lands comprising the primary open space system, which is described in the section, "Development Program and Plan," on page 3 and in the section, "Recreation," on page 40, will not be transferred to the private sector. A secondary open space system which will connect the primary open space system with community units built, operated, and/or owned by individuals and businesses may be conveyed to the private sector. In such instances, TVA will place appropriate covenants and restrictions in deeds or other instruments for conveyance of land or land rights to ensure retention of that part of the open space system.

COMMENT

"7. Figure 4. Conceptual Land Use Plan. Two significant historical sites, Bowman House and the Tipton House and Cemetery are designated within permanent housing sectors. Should not these historic sites be included within or buffered by open space?"

RESPONSE

The open space system will include historic sites and/or buildings, including the Bowman and the Tipton House and Cemetery. The section, "Development Program and Plan," has been revised to clarify this point. Also, as stated in section, "Historic Values, Archaeological Restoration and Protection," on page 41, "TVA will design its development standards and procedures to enhance and protect significant historical features."

COMMENT

"8. The two sections - Relationship Between Local, Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity and Irreversible and Irretrievable Commitments of Resources that Would be Involved in the Proposed Action Should it be Implemented are not addressed sufficiently. We would like to see a discussion of environmental tradeoffs, expected increase in recreational use over time, and irreversible commitments of social and economic factors."

RESPONSE

TVA believes that, when read in the context of the entire environmental impact statement, the two sections adequately address the issues. Essentially, the Timberlake project does not involve a tradeoff between short-term uses of man's environment and long-term productivity. As a permanent new community, Timberlake by definition involves long-term uses of the environment. The impacts and tradeoffs of the long-term options for utilizing the land base are discussed in the section, "Alternatives to the Proposed Action." The expected increase in recreational use over time is discussed on page 3. The statement recognizes that committing the land base to Timberlake is an irrevocable and irretrievable commitment. TVA also recognizes that, inherent in this commitment, the transformation of the environs of the project area from a rural to an urban-oriented area constitutes an irreversible commitment.

COMMENT

"9. The Discussion of Alternatives to the Proposed Action does not include the alternate means of meeting the project purposes nor different levels of development.

[and]

14. The section on alternatives to the proposed action beginning on page 42 is confusing in that all the alternatives being considered are also a part of the Timberlake concept as set forth in the statement. That is, Timberlake will consist of industrial development, both public and commercial recreation and residential subdivision. It is difficult to consider the alternatives to the proposed action when they in fact seem to be part of the Timberlake project."

RESPONSE

TVA considers the proposed balanced resource development concept described in this statement an optimum way to organize and manage the physical, economic, and associated resources brought together by the Tellico project. This concept evolved through numerous discussions and planning efforts with citizens, local officials, and other organizations in the project area. The concept as manifested in Timberlake was determined to be a most efficient vehicle for realizing many of the goals and objectives of the area which are discussed in Section III, "Relationship to Regional Goals and Objectives," of this statement. Since planning efforts were specifically addressed to developing those specific opportunities

presented by the Tellico project, the Tellico site was the only spatial location considered for Timberlake. Thus, given the site specific and the optimizing nature of the Timberlake project, a discussion of alternatives to this concept becomes one of developing less than the complete integrated community on site. Therefore, each of the alternatives listed (except that of no development) envisions the use of the site for one or more individual uses that could be incorporated into the Timberlake concept but not necessarily at the same scale as described in each individual alternative.

In regard to discussion of "levels of development," TVA has selected the target population of 30,000 residents by the end of the development period after careful study and consideration of the information and data contained in the documents listed in Appendix C of this statement. TVA believes the target size is reasonable for planning and impact analysis purposes. TVA does recognize that there are many contingencies inherent in a project of this magnitude and that the community may or may not reach the target population by the end of the 20-year development period as illustrated by the planning ranges in tables 26, 30, and 32. TVA does not, however, view a different size community as an alternative to Timberlake, but rather a "momentary point" in the community's evolving history and therefore does not believe a discussion of "level of development" is warranted. TVA believes the management program described on pages 4 through 7 of the statement will ensure that whatever level of development is attained by Timberlake during the development period, the then-existing combination of developed resources will be consistent with the overall goals and objectives of the area and will be compatible with the area environment.

COMMENT

"10. The recent announced withdrawal of the Boeing Company from a partnership with TVA now raises the question of the implementation of the Timberlake project. We believe a supplement to the environmental statement resulting from this action would be warranted."

RESPONSE

The Boeing Company did not withdraw from a partnership with TVA. On September 13, 1973, TVA and The Boeing Company entered into an interim agreement to develop the necessary program information and understandings that would enable the parties to reach a decision concerning their continued participation in the planning and other respective roles in the joint development of Timberlake. These negotiations have been terminated. TVA has considered two basic approaches to the cooperative planning, development and management of Timberlake by the public and private sector: (1) an undertaking by TVA and a private "master" developer having substantial management and financial resources, and (2) an undertaking by TVA and several smaller developers who individually would not have the management and financial resources to serve as a "master" developer. TVA believes either arrangement will produce satisfactory results and therefore considers both approaches viable future options. Both approaches will involve the optimum participation by the private sector, pursuit of the same project objectives, and protection of the public interest through improvements in the human environment. Therefore, the environmental impact of the Timberlake project will be essentially similar under either management option. In the absence of a "master" developer, however, a somewhat slower development pace might be encountered, and more TVA resources may be required in planning, developing, and managing the project during the development period.

COMMENT

"11. The statement seems to be noticeably weak in indicating the economics of the project, that is, how the funding is to be provided to carry out the project concepts. With the withdrawal of The Boeing Company and the failure of the Federal government to adequately fund any new town developments, it seems that the matter of financing this project to completion needs to be strongly addressed in some form. The environmental statement may or may not be the proper vehicle. However, a 20-year development program as anticipated would need strong financing. Should this financing not develop on a reasonable timetable, the environmental consequences could be significant."

RESPONSE

The difficulties encountered by private new town developments in obtaining adequate financing and Federal assistance are not indicative of the situation TVA will confront at Timberlake. Unlike Federally assisted privately developed

new towns, Timberlake will be a Federal project. Even if there is a short-fall in Congressional appropriations for Timberlake in any given year, TVA is not subject to the short-term financial pressures which may plague a private corporation and will be able to maintain Timberlake as a viable project until such time as adequate funding is again available. Since the financial commitment of the private sector, with or without a master private developer, such as The Boeing Company, has always been assumed to be dependent upon adequate front-end public investment, the withdrawal of The Boeing Company simply means that when the public portion of Timberlake is adequately funded either another private developer will be involved or TVA will deal directly with individual tract or project developers.

COMMENT

"12. There are several assumptions built into the project concept which may or may not materialize. One is the state park first mentioned on page 3. Thus, there are many intangibles, and if some of these do not materialize for whatever reason, the project could be in serious difficulty."

RESPONSE

As stated in the section, "Planning and Development Approach," on page 4, "Accomplishment of the new community objectives requires the planning for Timberlake to be carried out in a manner permitting early decisions to be made without foreclosing future desirable program options. To be effective, the planning and development process must be dynamic and flexible to change with new information, economic conditions" TVA believes the basic industrial-recreational economic base theory for Timberlake is sound. Intangibles such as the proposed state park are to be expected in a project of this magnitude. Certainly in TVA's viewpoint it is desirable to have state participation in planning and developing of an appropriate state park; however, planning must and will include alternative strategies to compensate for lack of certainty as to the final use of certain land parcels within Timberlake.

COMMENT

"13. The original concept of the Tellico project was that Timberlake was a new community to be located on a specific portion of the reservoir. It now appears that the concept of Timberlake has been altered to encompass

the entire 16,500-acre reservoir and surrounding 16,000 acres of land. Some discussion of the changing concept from a limited new community to a total reservoir development would seem to be in order."

RESPONSE

TVA has always been committed to the comprehensive planning of the development of all of the Tellico Reservoir shorelands. Whether or not all of the Tellico shorelands will ultimately be within the municipal boundaries of the town of Timberlake, TVA considers the planned development of all such shorelands to be a part of the Timberlake project.

COMMENT

"15. Finally, on a much less serious note, we were somewhat amused by the last sentence on page 25. Are we to assume that the southern bald eagle which is 'only occasionally sighted' in the area and will not become a 'less frequent visitor' will in fact never be seen again!"

RESPONSE

The sentence in question has been rewritten.



RAY BLANTON
GOVERNOR

STATE OF TENNESSEE
DEPARTMENT OF PUBLIC HEALTH
NASHVILLE 37219

Eugene W. Fowles, M.D., M.P.H.
Commissioner

February 26, 1975

Mr. Stephen H. Norris
Grant Review Coordinator
Office of Urban and Federal Affairs
Suite 108
Parkway Towers Building
Nashville, Tennessee 37219

RE: Draft Environmental Impact Statement, Tennessee Valley Authority, Timberlake New Community

Dear Mr. Norris:

In response to your memorandum of December 9, 1974, staff of our Divisions have reviewed the above referenced project and following are their comments:

DIVISION OF AIR POLLUTION CONTROL

We have reviewed the above draft environmental statement and based on available information it appears that this project should not prevent Tennessee from attaining and maintaining the Tennessee Ambient Air Quality Standards.

DIVISION OF SANITARY ENGINEERING

We have completed our review of the draft of the Environmental Impact Statement for this project, and have the following comments for consideration:

1. Page 28, Item No. 2, Wastewater Treatment

This section states that by the end of the twentieth development year there will be a requirement for treatment of about 11 million gallons per day (MGD) of wastewater from residential, recreational, commercial, and industrial sources. Also that in the interim period a series of package plants will be located in the developing areas and discharge effluents will be made through deep-water diffuser outfalls in the Tellico Reservoir.

Our comments on this are that it will require at least four years for the design and construction of wastewater facilities. Recognized design criteria require a design period of ten-twenty (10 - 20) years;

therefore, based on Table I, Appendix B, at the end of a 14-year period a residential population alone will be 12,000 people. If this is coupled with the industrial, commercial, and other loadings, it is our opinion that the trunk lines, laterals, and plants should be designed to treat the anticipated 11 million gallons per day of wastewater, in the initial stage.

2. Pages 34, 35, and 36, Item 2, Wastewater Treatment System
The treatment method and concept for the central plant should be selected from the best possible method available as of today; and that all Timberlake wastewater be pumped, or be allowed to flow by gravity, to a treatment plant on the Tennessee River, and the effluent discharged into the Tennessee River below the point where the Little Tennessee River discharges into the Tennessee River.

The statement that wastewater from certain industries located in Timberlake will require pre-treatment before being discharged to the central treatment plant is correct, and any discharges must have the approval of the Division of Sanitary Engineering before discharging to the central plant. Based on Table II, Appendix B, it appears that a majority of the industries with potential of locating in the Timberlake area will require pre-treatment before being discharged into the central treatment plant.

3. Page 34, Item D-1, Water System
Plans and specifications have been approved by this Division for the construction of the first phase of the water treatment plant, and it is anticipated that the construction will be completed within a 2-year period.
4. ~~Page 32, Item G, Government and Institutions~~
A statement is made that except for the water supply, no formal agreements have been reached concerning the provision of services and facilities. ~~A contract between Loudon County and Monroe County, entered into on December 3, 1974, has established the Tellico area services system, such system established under the inter-local cooperation act, TCA 12-801 and also the act relating to urban type public facilities TCA 5-1601. This will be the authority to plan, construct and operate water, sewer, solid waste and other services.~~

DIVISION OF WATER QUALITY CONTROL

The Division of Water Quality Control has reviewed the draft environmental impact statement for the above referenced development and recognizes the fact that there is insufficient information to perform an in-depth review of the proposal. TVA is reminded that engineering plans and specifications

Mr. Stephen H. Norris
February 26, 1975
Page 3

must be prepared and submitted to the Division of Water Quality Control on development related to the direct or indirect discharge of wastewaters into surface streams. At that time the Division will establish appropriate standards to protect the existing high quality of water in the receiving stream. It has been the Division's experience that in the creation of a reservoir the stream biota is affected and in some cases adversely so. It is requested that TVA recognize this change and document the same in final impact statement.

Any construction activity adjacent to surface watercourses is known to produce undesirable effects on water quality due to silt-laden surface runoff and in some instances spent fuel oils spilled upon the ground have reached surface waters. Every precaution must be exercised not only in the development of the land and the building projects but as well as highway construction along the shore-lines to prevent silt-laden waters from entering the watercourse.

The Little Tennessee River from the mouth to Chilhowee Dam is presently classified for all uses in accordance with the General Water Quality Criteria for the definition and control of pollution in the waters of Tennessee. In addition, it is a recognized trout stream. A minimum dissolved oxygen content of 6 mg/l shall be maintained and a maximum temperature of recognized trout streams shall not exceed 68°F. To date TVA has not submitted a formal request to the Tennessee Water Quality Control Board for a change in stream classification. As mentioned above, experience indicates that there will be some detrimental effects upon existing stream biota in the creation of this reservoir.

It is noted that there will be a 9-foot navigable channel constructed. Additional information is requested regarding the construction procedures to be followed particularly if a part of the natural channel is to be dredged.

In reference to the effect of Timberlake on Eutrophication in Tellico Reservoir, the following statement was made, "In as much as the mean concentration of total nitrogen and phosphorus in the reservoir are expected to be only 0.39 mg/l and 0.034 mg/l respectively, the reservoir waters cannot be considered to be eutrophic." It is difficult to ascertain the assumption by which this prediction is made. Eutrophication is the so-called final stage in the aging of a reservoir and problems associated with nutrients do occur long before eutrophication exists.

Plan for waste treatment facilities during construction phases must be submitted to this Division for review and approval prior to construction.

The Division of Water Quality Control uses minimum instantaneous flows of 7-day duration over a 20-year period where such records are available

Mr. Stephen H. Norris
February 26, 1975
Page 4

to establish effluent criteria. There is a question regarding the minimum continuous flow of some 1,350 cfs discussed in this report. According to USGS records, the minimum instantaneous flow is much lower than the above figure.

The preliminary planning for Timberlake wastewater collection assumes that a central treatment plant is to be located near River Mile 16. Before prior commitments are made regarding this location, further communication with this Division is in order.

The Division will be pleased to review and comment upon any plans which affect water quality as these plans are developed.

DIVISION OF SANITATION AND SOLID WASTE MANAGEMENT

The Housing and Recreation Section Staff has reviewed the documents submitted to the Environmental Sanitation Division.

Impact in the program areas of public schools, day care centers, campgrounds and other recreational facilities, and housing has been considered. Primary objectives in the plan for Timberlake will have definite involvement with the aforementioned environmental program areas.

At the present time, the Environmental Sanitation Division is involved in providing service to the community where the development is proposed, primarily through the East Tennessee Regional Office and the local health departments of Loudon and Monroe Counties. Regardless of whether Timberlake, once development begins, is served by the Tennessee Department of Public Health or otherwise, additional environmental health staff personnel should be considered to review plans of proposed development and implement programing that will assure compliance with State laws pertaining to environmental sanitation.

Development of recreation in New Timberlake City appears to be one of the major objectives with the TVA lakes and shorelines being utilized and with expanded neighborhood recreational programs for residents of the community. The proposed plans calls for 3700 acres or 23 percent of the site to be used for recreation. The development appears to be well planned with maximum consideration given to environmental preservation. Coordination with this Division is needed to assure compliance with TCA Section 53-3801 - 53-3806.

The environmental impact on public schools, day care centers and other institutions can be effectively handled by development of these facilities

Mr. Stephen H. Norris
 February 26, 1975
 Page 5

within the new city. As plans call for a four phase development over a 20 year period with a maximum population at the end of the period of 42,000 adequate institutional facilities can be expected to be constructed within the new city to handle the residential and industrial development. Water supply, sewage disposal, solid waste collection and disposal, will have a definite impact on the degree of development of the new city.

In summary, New Timberlake City is proposed as a development with plan growth over a period of 20 years providing residential, commercial, industrial, and recreational development with necessary services being provided to accommodate the new city and with the intent of maximum consideration of the environment and of the health and welfare of the residents.

It is anticipated that at least one additional Environmentalist will be needed before the end of Phase I.

The Solid Waste Section has the following comments:

1. On Page 5, Article IV. A-2: It sounds as if TVA is proposing to take over the monitoring or inspectional duties of state agencies where Timberlake facilities are involved. It should be made clear that this development must comply with state regulations.
2. Page 14, Article I. B-4: This section proposes to use either one or both of the two landfills operated by others for solid waste disposal. No city collection system or transfer facility is proposed, however, to transport the waste generated in Timberlake to the sites.
3. Page 17, Article II. 2-G: This section states that Timberlake is not served by a public solid waste collection or disposal system. This section further states that Loudon County is planning a solid waste collection and disposal system. If Timberlake is to be incorporated, this proposed county system would not serve it.
4. Page 37, Article II. D-4, a.: This section again deals with the possibility of Timberlake using the proposed Monroe County landfill which is in the early planning stage or the Red Ridge facility.

The Monroe County facility cannot be relied on because it is too far from being operational at this time. The Red Ridge site has only had forty acres approved. This section gives the projected life of it as five years. There will be very little waste, if any, generated

Mr. Stephen H. Norris
 February 26, 1975
 Page 6

by Timberlake in the next five years, since it has a twenty year completion schedule. There is no assurance at this time that any of the remainder of the 1,000 acre Red Ridge site can or will be approved for landfilling. The remaining portion of land has not even been evaluated for landfill suitability at this time. A private act may also prevent further expansion of this facility.

b. An incinerator of the type now being considered for Lewisburg is proposed as an alternative. We would point out that this facility has not been constructed yet, and has not proven that it can meet air pollution standards, or that it is a desirable means of solid disposal. There is still the residue from the incinerator, along with non-combustibles that must be disposed of by landfilling. It has also not been proven at this time that the operational costs for this incinerator can compare with landfilling. Lewisburg's study showed the costs would be higher and the projected cost of construction of the facility has doubled since planning started and the plans have not even been approved yet.

It is true that the original concept was modified at Lewisburg to install a heat recovery system.

c. This section also lists as an alternative, delivery of Timberlake's waste to a TVA resource and energy recovery transfer station for transportation to Knoxville or Chattanooga. It does not give the location of the transfer station but if it is very far it might be necessary to install a transfer station at Timberlake.

5. Page 40, Article II, E-3: This section deals with establishment of recreational facilities on 2,300 acres of the Timberlake Site. These type facilities are usually fairly high generators of solid wastes and provisions should be made for their storage, collection, and disposal prior to opening them to the public.
6. Page 50, Footnote 68, states the projected solid waste generation rate for Timberlake assumes a per capita generation rate of three pounds per day. This figure is accurate only so far as it applies to residential generation and would not include the commercial and industrial wastes from the proposed industrial and commercial establishments.
7. Figure 20, Appendix A: This diagram would seem to indicate a wastewater treatment sludge that would have to be disposed of by landfilling.
8. Table 2, Appendix B: This table indicates that several of the proposed industries will generate solid wastes of a bulky or hard to handle nature. Special consideration must be given to the disposal of these materials.

Mr. Stephen H. Norris
February 26, 1975
Page 7

It appears that at this stage not enough consideration has been given to solid waste disposal. All proposals have been very general with a lot of assumptions that may prove to be only assumptions.

Thank you for the opportunity to comment on this project. I am sorry for the delay in getting this material to you.

Sincerely yours,



C. Ron Culberson
Bureau of Environmental Health Services

CRC/sr: 2-6

TVA Responses to Comments from
Department of Public Health
Division of Sanitary Engineering

COMMENT

"1. It is our opinion that the trunk lines, laterals, and plants should be designed to treat the anticipated 11 million gallons per day of wastewater, in the initial stage."

RESPONSE

As discussed on page 35 of the statement, the size and growth rate of the community may be sufficient to warrant construction of a central treatment plant between the first 7 to 12 years of the project. At that time, design considerations will include anticipated future loads to be placed on the trunk lines, laterals, and sewage treatment facilities.

COMMENT

"2. The treatment method and concept for the central plant should be selected from the best possible method available as of today; and that all Timberlake wastewater be pumped, or be allowed to flow by gravity, to a treatment plant on the Tennessee River, and the effluent discharged into the Tennessee River below the point where the Little Tennessee River discharges into the Tennessee River."

RESPONSE

A number of factors, primary among which are environmental impact and economic feasibility, will be considered in much more detail before the final selection is made from the several alternative central plant concepts discussed in section, "Wastewater Treatment System."

COMMENT

"4. A statement is made that except for the water supply, no formal agreements have been reached concerning the provision of services and facilities. A contract between Loudon County and Monroe County, entered into on December 3, 1974, has established the Tellico Area Services System, such system established under the interlocal cooperation act, TCA 12-801 and also the act relating to urban type public facilities TCA 5-1601. This will be the authority to plan, construct and operate water, sewer, solid waste and other services."

RESPONSE

TVA agrees the Tellico Area Services Board is an appropriate organization to provide sewer, solid waste, and other services as authorized by a contract between Loudon and Monroe Counties, Tennessee, dated December 3, 1970, and pursuant to TCA 12-801 and TCA 5-1601 et seq.

Division of Water Quality Control

COMMENT

"TVA is reminded that engineering plans and specifications must be prepared and submitted to the Division of Water Quality Control on development related to the direct or indirect discharge of wastewaters into surface streams. At that time the Division will establish appropriate standards to protect the existing high quality of water in the receiving stream."

RESPONSE

As stated in the section, "Public-Private Developer Relationship," on page 5, "TVA will cooperate with state and local governments and other public agencies to establish reasonable development policies, guidelines, and environmental standards; and to identify all applicable public regulations, policies, and codes governing the development construction."

COMMENT

"It has been the Division's experience that in the creation of a reservoir the stream biota is affected and in some cases adversely so. It is requested that TVA recognize this change and document the same in final impact statement." [and] "To date TVA has not submitted a formal request to the Tennessee Water Quality Control Board for a change in stream classification. As mentioned above, experience indicates that there will be some detrimental effects upon existing stream biota in the creation of this reservoir."

RESPONSE

The proposed action of this statement is the development of a new community on the shorelands of the Tellico Reservoir. The impacts of the "creation of a reservoir" are discussed in the Tellico Project Final Environmental Statement - OHES-EIS-72-1 (TVA, Chattanooga, Tennessee, February 10, 1972). Any change in the stream classification of the Little Tennessee River that may be

necessary would be required by the Tellico project and not by the Timberlake project.

COMMENT

"Every precaution must be exercised not only in the development of the land and the building projects but as well as highway construction along the shorelines to prevent silt-laden waters from entering the watercourse."

RESPONSE

Policy to be followed during planning and development of Timberlake in regard to controlling surface-water runoff during construction is described in the section, "Storm Water Runoff," on page 28.

COMMENT

"It is noted that there will be a 9-foot navigable channel constructed. Additional information is requested regarding the construction procedures to be followed particularly if a part of the natural channel is to be dredged."

RESPONSE

No dredging in the natural channel is required in connection with the Timberlake project.

COMMENT

"In reference to the effect of Timberlake on Eutrophication in Tellico Reservoir, the following statement was made, 'Inasmuch as the mean concentration of total nitrogen and phosphorus in the reservoir are expected to be only 0.39 mg/l and 0.034 mg/l respectively, the reservoir waters cannot be considered to be eutrophic.' It is difficult to ascertain the assumption by which this prediction is made. Eutrophication is the so-called final stage in the aging of a reservoir and problems associated with nutrients do occur long before eutrophication exists."

RESPONSE

TVA believes that the concentrations of nutrients (nitrogen and phosphorus) in Tellico Reservoir will not be high enough to lead to accelerated eutrophication (excessive growths of algae). This belief is based upon experience with nitrogen and phosphorus levels in other reservoirs in the Tennessee Valley.

For reference, inflowing waters to nearby Douglas Reservoir show mean concentrations of 0.74 mg/l total nitrogen and 0.100 mg/l total phosphorus. Similarly inflows to Fort Loudon Reservoir show 1.17 mg/l total nitrogen and 0.119 mg/l total phosphorus. Excessive blooms of algae have not been observed in either of these reservoirs.

As regards the effect of Timberlake on eutrophication in Tellico, the waters of Tellico after Timberlake is fully developed will still be some of the least eutrophic in the Tennessee Valley.

COMMENT

"The Division of Water Quality Control uses the instantaneous minimum flow on regulated streams and the three-day minimum, twenty-year recurrence interval flows in unregulated streams in the calculation of receiving stream assimilative capacity. There is a question regarding the minimum continuous flow of some 1,350 cfs discussed in this report. According to USGS records, the minimum instantaneous flow is much lower than the above figure."

RESPONSE

Chilhowee Reservoir is normally operated to provide a minimum continuous release of 1,350 cfs. However, during scheduled special operations, flow may be shut off at the dam. These are rare occurrences and are generally only for a few hours' duration. Since these are planned events, downstream operators will be able to monitor or reduce wastewater discharge during these periods of low flow.

The observed minimum flow at the Little Tennessee River below Chilhowee Dam streamgage was 23 cfs on September 30, 1974, which included the flow from Cochran Creek.

Division of Sanitation and Solid Waste Management

COMMENT

"1. On Page 5, Article IV. A-2: It sounds as if TVA is proposing to take over the monitoring or inspectional duties of state agencies where Timberlake facilities are involved. It should be made clear that this development must comply with state regulations."

RESPONSE

As stated in the section, "Public-Private Developer Relationship," "TVA will cooperate with state and local governments . . . to identify all applicable public regulations, policies, and codes governing the development construction." TVA believes that as the public sponsor of Timberlake and having control of the land base, it will have a responsibility for monitoring compliance by participating developer parties with all applicable public regulations, policies, and codes governing the developing construction before the participants are permitted to proceed with construction.

COMMENT

"2. Page 14, Article I. B-4: This section proposes to use either one or both of the two landfills operated by others for solid waste disposal. No city collection system or transfer facility is proposed, however, to transport the waste generated in Timberlake to the sites."

"3. Page 17, Article II. 2-C: This section states that Timberlake is not served by a public solid waste collection or disposal system. This section further states that Loudon County is planning a solid waste collection and disposal system. If Timberlake is to be incorporated, this proposed county system would not serve it."

RESPONSE

These sections of the statement describe the existing area environment or planned area infrastructure under the broad category of "Description of Environment Affected." Solid waste collection services are discussed in the rewritten section, "Solid Waste" on page 37.

COMMENT

"4. Page 37, Article II. D-4, a.: This section again deals with the possibility of Timberlake using the proposed Monroe County landfill which is in the early planning stage or the Red Ridge facility.

The Monroe County facility cannot be relied on because it is too far from being operational at this time. The Red Ridge site has only had forty acres approved. This section gives the projected life of it as five years. There will be very little waste, if any generated by Timberlake in the next five years, since it has a twenty year completion schedule. There is no assurance at this time that any of the remainder of the 1,000 acre Red Ridge site can or will be approved for landfilling. The remaining portion of land has not even been evaluated for landfill suitability at this time. A private act may also prevent further expansion of this facility.

b. An incinerator of the type now being considered for Lewisburg is proposed as an alternative. We would point out that this facility has not been constructed yet, and has not proven that it can meet air pollution standards, or that it is a desirable means of solid disposal. There is still the residue from the incinerator, along with non-combustibles that must be disposed of by landfilling. It has also not been proven at this time that the operational costs for this incinerator can compare with landfilling. Lewisburg's study showed the costs would be higher and the projected cost of construction of the facility has doubled since planning started and the plans have not even been approved yet.

It is true that the original concept was modified at Lewisburg to install a heat recovery system.

c. This section also lists as an alternative, delivery of Timberlake's waste to a TVA resource and energy recovery transfer station for transportation to Knoxville or Chattanooga. It does not give the location of the transfer station but if it is very far it might be necessary to install a transfer station at Timberlake."

RESPONSE

See rewritten section, "Solid Waste," on page 37.

COMMENT

"5. Page 40, Article II. E-3: This section deals with establishment of recreational facilities on 2,300 acres of the Timberlake Site. These type facilities are usually fairly high generators of solid wastes and provisions should be made for their storage, collection, and disposal prior to opening them to the public."

RESPONSE

TVA agrees.

COMMENT

"6. Page 50, Footnote 68, states the projected solid waste generation rate for Timberlake assumes a per capita generation rate of three pounds per day. This figure is accurate only so far as it applies to residential generation and would not include the commercial and industrial wastes from the proposed industrial and commercial establishments."

"8. Table 2, Appendix B: This table indicates that several of the proposed industries will generate solid wastes of a bulky or hard-to-handle nature. Special consideration must be given to the disposal of these materials."

RESPONSE

The estimate of three pounds per capita per day did not include commercial and industrial wastes. Solid waste will be generated by various sources during the development period: construction, residential, commercial, institutional, and industrial activities. Commercial mining and agricultural wastes are not expected to be significant within Timberlake. The quantity of solid waste generated by the residents and commercial and institutional functions will vary in direct relationship to the population present at any particular time. TVA has reestimated the quantities of solid waste generated by these activities and paragraph 4, "Solid Waste," has been changed to reflect the revised estimate. Footnote 67 and table 32 have also been changed to clarify this point.

The quantity of solid waste generated from construction activities is difficult to predict with any accuracy due to the limited data available on solid waste generation at construction projects; therefore, no estimate has been included. Similarly, the industries listed in the environmental statement are prospective in nature, and it is not practical to speculate as to which specific industries will locate within Timberlake, nor on quantities of solid waste each might generate. The development of a collection and disposal system may include industrial collection, if feasible. If industrial wastes are of such a nature that public collection is not feasible, then individual industries will be required to provide acceptable means for solid waste handling and disposal which will comply with Tennessee Department of Public Health regulations.

COMMENT

"7. Figure 20, Appendix A: This diagram would seem to indicate a wastewater treatment sludge that would have to be disposed of by landfilling."

RESPONSE

Figure 21, Appendix A refers to three possible wastewater treatment concepts that might be considered when the size and growth rate of the community becomes sufficient to warrant construction of a central treatment plant. Sludge produced by one of these plants would not necessarily have to be disposed of by landfilling. It could be disposed of by thermal processing or other land application methods, such as fertilizer or soil conditioner.

Depending on the method of disposal and/or use of the sludges, pretreatment and conditioning to remove undesirable materials and substances may be required.

COMMENT

"It appears that at this stage not enough consideration has been given to solid waste disposal. All proposals have been very general with a lot of assumptions that may prove to be only assumptions."

RESPONSE

Certainly during the early years of a new community when front-end costs are quite high but the population impact is slight, it would be reasonable to expect the developer to minimize the required investment in equipment, facilities and/or services when already adequately available, including solid waste management. Therefore, if existing approved landfill sites or other disposal facilities are available in the area for use during the early years of Timberlake, they will be utilized. Since Timberlake is to be a planned community incorporating selective demonstrations, in the longer term the most modern economically viable systems will be considered for the project. Innovative collection systems concepts of today, such as vacuum collection will be considered as may thermal processing with energy recovery. Resource recovery will be emphasized. If in the short term the availability of suitable landfill sites in the area decrease, emphasis will be placed on other disposal systems which will comply with the Department of Public Health regulations. In any case, specific proposals for a solid waste management system will be developed during preparation of the detailed first development stage plans for Timberlake.



JAN 16 RECD

TENNESSEE ENERGY OFFICE

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CAPITOL HILL BUILDING

NASHVILLE 37219

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STATE OF TENNESSEE
WINFIELD DUNN, Governor

CARROLL V. KROEGER, SR.
Director

January 15, 1975

Mr. Stephen H. Norris
Grant Review Coordinator
Office of Urban and Federal Affairs
Suite 108, Parkway Towers Building
Nashville, Tennessee 37219

Re: Environmental Statement:
Timberlake Community

Dear Mr. Norris:

Our staff has reviewed the Draft Environmental Statement prepared by TVA concerning the proposed Timberlake Community project.

On the basis of our review, we feel there are several deficiencies in the draft statement.

It is stated on pages 8 and 9 that the proposed development "offers a wide range of opportunities for testing and implementing specific energy technology in community design." Since alternative energy technologies can have significantly different environmental and economic impacts, it would be appropriate for the Tennessee Valley Authority to specify those technologies, construction materials, energy sources, and conservation plans it is considering for this development.

Furthermore, since industrial development is considered to be an integral part of the Timberlake project, the environmental statement should consider the specific types of industries that will be attracted, the energy needs of those industries, and the capacity of energy suppliers to meet those needs. Natural gas supplies cannot be committed to the development (ES 38), and, therefore, energy users will be committed to using primarily oil, coal, and electricity for their energy needs. The respective amounts of alternative energy use and the environmental consequences of such use should be explored more completely in the environmental statement.

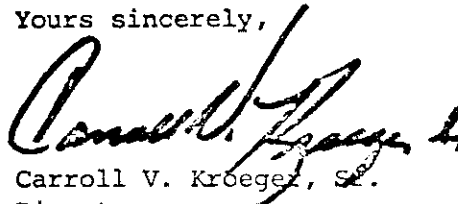
Mr. Stephen H. Norris
Page 2
January 15, 1975

The statement proposes to investigate public transportation systems. In view of the national need to conserve petroleum, as well as the adverse environmental impacts of automobile traffic, the plan should include a definite commitment to the development of a comfortable, efficient, and comprehensive public transit system. Likely continuing increases in the price of gasoline make such a system even more desirable.

Finally, some additional consideration should be given in the statement to the funding of the project and the consequences, if any, on the residents of the TVA region.

I trust that these comments will be helpful.

Yours sincerely,



Carroll V. Kroeger, Sr.
Director
Tennessee Energy Office

CVK:vfc

cc: W. H. Schwarzschild, III

TVA Responses to Comments from
Tennessee Energy Office

COMMENT

"Since alternative energy technologies can have significantly different environmental and economic impacts, it would be appropriate for the Tennessee Valley Authority to specify those technologies, construction materials, energy sources, and conservation plans it is considering for this development."

RESPONSE

One of the demonstration features of the Timberlake project is energy conservation. The entire 20-year development of Timberlake will provide the opportunity to incorporate existing and new energy conservation technologies. TVA believes, therefore, that it would be inappropriate to limit the project to a specific inflexible energy conservation plan at this time. However, cooperative activities are currently underway between TVA and the University at Buffalo Foundation, Inc., (New York) to conduct a program of general investigative research related to the interactions between energy use, conservation, and management systems and land use planning, development, and building design for possible application to Timberlake. Other studies and participants are expected as planning and development progress.

COMMENT

"...the environmental statement should consider the specific types of industries that will be attracted, the energy needs of those industries, and the capacity of energy suppliers to meet those needs. The respective amounts of alternative energy use and the environmental consequences of such use should be explored more completely in the environmental statement."

RESPONSE

For the identified industries shown in table 2 of Appendix B, estimated fuel and electric energy consumption per employee are shown in table 33. Since natural gas is an important fuel input to most of these industries, and assuming the availability of natural gas supply for industrial users at Timberlake will continue to be questionable, one of two possible alternative situations might develop: substitution of other fuels for natural gas and/or establishment of an industrial mix with minimum natural gas needs.

TVA discussions with large industrial users of electricity in the Tennessee Valley region revealed a preference for fuel oil as an alternative to natural gas in production processes. If fuel oil is not available, then the conversion to coal or electricity might be possible, but is not considered a favored alternative for those industries making heavy use of process steam. Presently, substitution of electricity for direct fossil fuel applications and interfuel substitution among fossil fuels are occurring in the State of Tennessee. Substitution of electricity for natural gas is possible and taking place for space heating, small process steam application, oven and drying applications, and small electric furnaces. Secondly, there is the possibility that the lack of natural gas service to the Timberlake area could mean that only industries which have minimal requirements for natural gas or can convert to energy sources other than natural gas could reasonably be expected to locate in Timberlake. TVA recognizes this possibility in footnote 16, in stating, "Certainly, the analysis [research conducted to identify industries shown in table 2] was not designed to isolate those industries which may have one or several location requirements that completely overshadow all others and therefore would cause [or not cause] them to locate at Timberlake."

Future choices of fuels by industry are subject to many changing factors and conclusions concerning such choices are necessarily speculative. These choices will depend upon the expected price, availability and reliability of the supply of various alternative energy sources, changing technology, environmental regulations, and the cost of pollution control equipment. Also there are practical difficulties in estimating the respective amounts of energy substitutes for a given fuel. A discussion of the numerous factors that must be considered and the types of assumptions necessary for calculating the electric load equivalent for natural gas is discussed in the report, "Energy in Tennessee, The Report of the Governor's Task Force on Energy," Nashville, Tennessee, November 19, 1973, pages 86-89. Given these contingencies of methodology, it would also be highly speculative to extrapolate the environmental consequences of alternative uses. Whether or not the shortage of natural gas causes a substitution to alternative fuels or creates an industrial mix with minimum natural gas need to occur at Timberlake, all industries would be expected to comply with all environmental regulations regardless of energy sources used.

COMMENT

"In view of the national need to conserve petroleum, as well as the adverse environmental impacts of automobile traffic, the plan should include a definite commitment to the development of a comfortable, efficient, and comprehensive public transit system."

RESPONSE

TVA agrees that a comfortable, efficient and comprehensive public transit system would be an asset to Timberlake residents, and is a transport alternative that could conserve petroleum and possibly reduce automobile traffic. The major obstacle, however, to providing public transport improvements is lack of revenue passengers. Certainly in the early years of Timberlake there will be an insufficient number of passengers to allow a system to be financially feasible unless major changes in public policy in regard to mass transit are forthcoming. Therefore, TVA believes a more prudent course of action at this time is to consider public transportation options as each project stage plan is developed to ensure that efficient land use occurs which would be conducive to ultimately supporting a reasonably self-sufficient public transit system within Timberlake.

COMMENT

"...some additional consideration should be given in the statement to the funding of the project and the consequences, if any, on the residents of the TVA region."

RESPONSE

The difficulties encountered by private new town developments in obtaining adequate financing and Federal assistance are not indicative of the situation TVA will confront at Timberlake. Unlike Federally assisted privately developed new towns, Timberlake will be a Federal project. Even if there is a short-fall in Congressional appropriations for Timberlake in any given year, TVA is not subject to the short-term financial pressures which may plague a private corporation and will be able to maintain Timberlake as a viable project until such time as adequate funding is again available.

Since the financial commitment of the private sector, with or without The Boeing Company, has always been assumed to be dependent upon adequate front-end public investment, the withdrawal of The Boeing Company will not impact the likelihood that Timberlake will be adequately funded. Since Congress will appropriate funds for the Timberlake project, TVA believes that the funding of the project will have a beneficial effect on the residents of the TVA region. No TVA power funds will be utilized.



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TENNESSEE HISTORICAL COMMISSION
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JAN 8 REC'D

LAWRENCE C. HENRY, Executive Director
State Historic Preservation Officer

January 7, 1975

MEMORANDUM

TO: Stephen H. Norris, Grant Review Coordinator
Office of Urban and Federal Affairs

FROM: Lawrence C. Henry *LCH*

SUBJECT: Comments on Tennessee Valley Authority Draft Environmental Statement for the proposed Timberlake Community

The document in question adequately identifies properties listed in the National Register of Historic Places.

It does not, however, communicate any specific information regarding the impact of the proposed project on these various properties. Thus we find that we are unable to confirm or dispute the statement on page 41, "Timberlake is not expected to have any adverse effect on the historic and cultural heritage of the area."

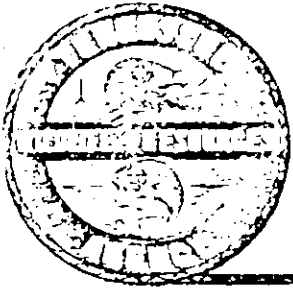
More detailed information regarding plans for historic properties should be included in the final draft. We reserve the right to assess those plans in order to make a determination of impact on the properties and to refer to the Advisory Council on Historic Preservation cases wherein we believe the impact to be adverse.

hs

TVA Responses to Comments from
Tennessee Historical Commission

RESPONSE

TVA has not determined the specific plans for each historic property as stated in the statement. They will be included into the open space system (page 3), and standards and procedures will be developed to enhance and protect significant historical features (page 41). Section III, page 2, subsection 9 page 13 and subsection 5, page 41, have been rewritten, and figure 11 and table 35 have been included to further describe the historic properties.



TENNESSEE WILDLIFE RESOURCES AGENCY

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P. O. BOX 40747
NASHVILLE, TENNESSEE 37204

HARVEY BRAY, Executive Director
ROY H. ANDERSON, Ass't. Director
GARY T. MYERS, Ass't. Director

January 15, 1975

Mr. Stephen H. Norris
Grant Review Coordinator
Office of Urban and Federal Affairs
Suite 108
Parkway Towers Building
Nashville, Tennessee 37219

Re: TVA Draft EIS - Timberlake New Community

Dear Mr. Norris:

We have reviewed TVA's draft EIS concerning proposed development of a new planned community of about 30,000 population on the shorelands of Tellico Reservoir. The community will feature the following characteristics:

- (1). Approximately 16,000 acres of the 21,000 acres of shorelands will be available for development (page 2, par. 4).
- (2). The community will be comprised of villages served by commercial facilities, community playgrounds, parks and schools (page 3, par. 2).
- (3). Trees and open space will separate clusters of housing (page 3, par. 3).
- (4). About 4,000 acres will be devoted to public and private recreational purposes, including marinas, resort-lodge-cabin complexes, camping areas, nature and hiking trails, etc. (page 3, par. 4).
- (5). A State Park is being considered in the area (page 3, par. 4).
- (6). A major waterfront industrial complex is planned (page 3, par. 5).
- (7). A public port facility will be supported by a 9-foot commercially navigable canal connecting Tellico Lake with the Tennessee River waterway (page 2, par. 3).

Mr. Stephen H. Norris
Page - 2
January 15, 1975

We have the following comments concerning this draft EIS:

Pages 28-29 (Water Quality)

It is reported that by the end of the twentieth development year there will be an estimated 11 million gallons per day of wastewater from residential, industrial, commercial and recreational sources (page 28, par. 5). During the early years of development, wastewater is to be processed by package secondary treatment plants and discharged through deep-water diffuse pipes into Tellico Reservoir. An unspecified type of advanced treatment is planned later.

Since the waters of Tellico Reservoir are expected to be of very high quality, we conclude it would be extremely difficult to avoid violation of the anti-degradation section of Tennessee's water quality standards if discharges are released into Tellico Reservoir. Would advanced treatment even be sufficient for the expected heavy residential, industrial, and commercial wastewater load? What kinds of industry can be attracted that could meet this standard unless they indeed could attain the goal of the Water Pollution Control Act for no discharge of pollutants by 1985 (page 29, par. 4)?

We expect Tellico Reservoir to be a two-story reservoir, with the warm epilimnion supporting warmwater fish and the cold hypolimnion supporting trout. If the reservoir suffers from any degree of eutrophication (page 28, par. 1), dissolved oxygen would be decreased in the hypolimnion and fewer trout could be supported.

We understand that all or most water is proposed to be released from the upper 12-feet of Tellico Reservoir. We expect this to result in stagnation of the hypolimnion and warmer temperatures in the lower reservoir. Greater retention of sediment would also result. We further understand that this water will be released into Ft. Loudoun Reservoir rather than by its natural course through the Little Tennessee River to Watts Bar Reservoir. If true, the remaining portion of the Little Tennessee River would lose its natural stream characteristics and would revert to very warm stagnant backwater from Watts Bar Lake. The existing coolwater fish species would be expected to be eliminated.

During construction, sediment is proposed to be controlled by settling ponds, check dams, drainage ditches and other standard measures (page 28, par. 3). Release of sediment into the reservoir during construction could have serious long-term effects on aquatic life. The Little Tennessee River, on which Tellico Reservoir is being located, is presently highly productive of fish food organisms due to ample clean water of the proper temperature and a substrate consisting of clean gravel of perfect size. Any measurable amount of sediment would cover this desirable substrate, and greatly reduce production of aquatic life. The lack of low-level discharge from Tellico Dam would result in retention of all this sediment.

Mr. Stephen H. Norris
Page - 3
January 15, 1975

For purposes of water quality, we have the following recommendations:

- (1). control of sediment during construction by all possible methods
- (2). installation of highly advanced wastewater treatment facilities at the earliest possible development stage
- (3). concentrated efforts be made to attract only "clean" industries that are capable of little or no discharge
- (4). locate at least part of the wastewater treatment facilities on Watts Bar Reservoir, provided that this reservoir, especially Ft. Loudoun Tailwater, can be equally protected (see page 35, par. 5)
- (5). if dam design permits, release water through Tellico Dam from a low level
- (6). provide for a constant flow in the Little Tennessee River below Tellico Dam

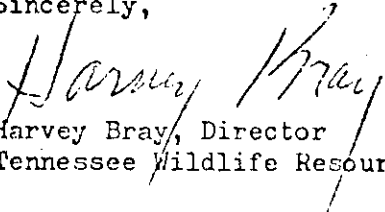
Appendix B

Lists are provided in Appendix B of mammals, birds, amphibians and reptiles, and trees that inhabit the area. We recommend that a list of fish also be included since the Tellico Reservoir is subject to significant impact from the development of the Timberlake Community. These fishes include the snail darter, (Percina) which is now being described as a new species and is unique to this river. The river also contains the blue sucker (Cyprinus elongatus) and the tangerine darter (Percina aurantiaca). These three species are recommended by Dr. David Etnier of the University of Tennessee for Tennessee's list of threatened and endangered species. This list is to be submitted to the Tennessee Wildlife Resources Commission for official approval after final review of the list by various authorities.

The woodchuck or groundhog (Marmota monax) is listed twice in Table B-7.

We appreciate this opportunity for comment.

Sincerely,


Harvey Bray, Director
Tennessee Wildlife Resources Agency

RMH/ss

cc: Mr. Harold Hurst
Mr. Hudson Nichols

TVA Responses to Comments from
Tennessee Wildlife Resources Agency

"...we conclude it would be extremely difficult to avoid violation of the antidegradation section of Tennessee's water quality standards if discharges are released into Tellico Reservoir. Would advanced treatment even be sufficient for the expected heavy residential, industrial, and commercial wastewater load? What kinds of industry can be attracted that could meet this standard unless they indeed could attain the goal of the Water Pollution Control Act for no discharge of pollutants by 1985 (page 29, par. 4)?"

RESPONSE

TVA is committed to developing Timberlake in a manner consistent with the maintenance of high-quality water in Tellico Reservoir. Allowing developments within Timberlake which would result in a violation of the antidegradation policy of the Tennessee Division of Water Quality Control would not be consistent with this commitment. TVA will cooperate with the Tennessee Division of Water Quality Control and the Environmental Protection Agency to ensure that treatment of wastewater discharges from Timberlake related developments will be adequate to protect the water quality within the Tellico Reservoir. As stated on page 29, TVA believes that adherence to the regulatory framework established by the Federal Water Pollution Control Act with its minimum requirement of compliance with state water quality standards, will allow the development of Timberlake with only a minimal impact on water quality in Tellico Reservoir. Although TVA believes that, in general, either standard or advanced treatment of waste streams will be sufficient, we recognize that certain industries may be environmentally acceptable at Timberlake only if they are closed cycle. TVA will assist Tennessee and the Environmental Protection Agency in assessing the water pollution abatement requirements of each industry desiring to locate at Timberlake. It is not possible to predict the abatement requirements at this time, particularly since the cumulative impact of each new industry will have to be assessed in light of the then-existing discharges into Tellico Reservoir.

COMMENT

"We expect Tellico Reservoir to be a two-story reservoir, with the warm epilimnion supporting warmwater fish and the cold hypolimnion supporting trout. If the reservoir suffers from any degree of eutrophication (page 28, par. 1), dissolved oxygen would be decreased in the hypolimnion and fewer trout could be supported."

RESPONSE

TVA believes the effect of Timberlake on eutrophication of Tellico Reservoir will be minimal. See section, "E. Water Quality." Concentrations of total nitrogen and phosphorus in the Fort Loudoun Reservoir near the planned location of the entrance to the canal are higher than presently in the lower Little Tennessee River, but excessive blooms of algae have not been noted in Fort Loudoun Reservoir or in any of the existing reservoir(s) on the Little Tennessee River.

COMMENT

"We understand that all or most water is proposed to be released from the upper 12-feet of Tellico Reservoir. We expect this to result in stagnation of the hypolimnion and warmer temperatures in the lower reservoir. Greater retention of sediment would also result. We further understand that this water will be released into Ft. Loudoun Reservoir rather than by its natural course through the Little Tennessee River to Watts Bar Reservoir. If true, the remaining portion of the Little Tennessee River would lose its natural stream characteristics and would revert to very warm stagnant backwater from Watts Bar Lake. The existing coolwater fish species would be expected to be eliminated."

RESPONSE

The proposed action of this statement is the development of a new community on the shorelands of the Tellico Reservoir. The impact on water quality and existing cool water fish species as a result of operation of the Tellico project is discussed in the Tellico Project Environmental Statement - OHES-EIS-72-1 (TVA, Chattanooga, Tennessee, February 10, 1972).

COMMENT

"During construction, sediment is proposed to be controlled by settling ponds, check dams, drainage ditches and other standard measures (page 28, par. 3). Release of sediment into the reservoir during construction could have serious long-term effects on aquatic life. The Little Tennessee River, on which Tellico Reservoir is being located, is presently highly productive of fish food organisms due to ample clean water of the proper temperature and a substrate consisting of clean gravel of perfect size. Any measurable amount of sediment would cover this desirable substrate, and greatly reduce production of aquatic life. The lack of low-level discharge from Tellico Dam would result in retention of all this sediment."

RESPONSE

TVA agrees "excessive" amounts of sediment present in a reservoir water could have an adverse impact on the aquatic environment. TVA recognizes this potential impact and has stated its commitment to developing Timberlake in a manner consistent with maintenance of this quality and the methods on control on pages 5 and 28 of the draft environmental statement.

COMMENT

"For purposes of water quality, we have the following recommendations:

- (1) control of sediment during construction by all possible methods
- (2) installation of highly advanced wastewater treatment facilities at the earliest possible development stage
- (3) concentrated efforts be made to attract only "clean" industries that are capable of little or no discharge
- (4) locate at least part of the wastewater treatment facilities on Watts Bar Reservoir, provided that this reservoir, especially Ft. Loudoun Tailwater, can be equally protected (see page 35, par. 5)
- (5) if dam design permits, release water through Tellico Dam from a low level
- (6) provide for a constant flow in the Little Tennessee River below Tellico Dam."

RESPONSE

- (1) See preceding response.
- (2) A proposed development strategy for the timing of the installation of the various stages of the waste treatment system is discussed beginning on page 34 of the statement.
- (3) Opinion noted.
- (4) The location of some portion of the wastewater treatment facilities for discharge to Watts Bar Reservoir is considered an alternative in the overall planning concept of Timberlake New Community. This and other alternatives will be studied in much more detail prior to final selection, as stated in section, "Wastewater Treatment System."
- (5) and (6) The proposed operation of the Tellico project is discussed in the Tellico Project Environmental Statement - OHES-EIS-72-1 (TVA, Chattanooga, Tennessee, February 10, 1972).

COMMENT

"We recommend that a list of fish also be included since the Tellico Reservoir is subject to significant impact from the development of the Timberlake Community. These fishes include the snail darter, (Percina) which is now being described as a new species and is unique to this river. The river also contains the blue sucker (Cycleptus elongatus) and the tangerine darter (Percina aurantiaca). These three species are recommended by Dr. David Etnier of The University of Tennessee for Tennessee's list of threatened and endangered species. This list is to be submitted to the Tennessee Wildlife Resources Commission for official approval after final review of the list by various authorities."

RESPONSE

A list of fishes known to presently occur in the Tellico impoundment area is included as table 10 in Appendix B.



STATE OF TENNESSEE
OFFICE OF URBAN AND FEDERAL AFFAIRS

SUITE 108
PARKWAY TOWERS BUILDING
NASHVILLE 37219

615-741-2714

February 25, 1975

Mr. M. I. Foster, Director
Division of Navigation Development
and Regional Studies
Tennessee Valley Authority
Knoxville, Tennessee 37902

RE: Draft EIS - Timberlake New Community

Dear Mr. Foster:

As the designated State Clearinghouse for Federal grant programs, we have reviewed the draft environmental statement for the above referenced proposed project. It is our understanding that close coordination has been maintained with the Tennessee Department of Transportation regarding transportation facilities within the Tellico reservoir area.

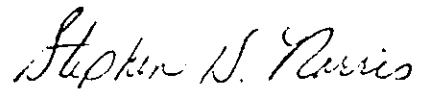
Enclosed are substantive comments and suggestions from other of our agencies, including the Tennessee Wildlife Resources Agency, Tennessee Department of Public Health, Tennessee Energy Office, and Tennessee Historical Commission. Their remarks address certain deficient areas and merit your responsive consideration in finalization of the environmental statement. We, therefore, urge a favorable response from TVA prior to State approval and ultimate implementation of the proposed project.

We appreciate the opportunity to review this proposal and for the extended time afforded to us for comment. Additional comments, specifically from the Tennessee Department of Conservation, are forthcoming, and will be forwarded as soon as possible. We requested, via phone, to Mr. Jim Gober on January 31, 1975 that four additional draft copies of the EIS be sent directly to Mr. Jerry Dillehay of the Department of Conservation to expedite their review. These copies have not been received as of this date. This has resulted in a delay in completing their review within the extended review period.

Mr. M. I. Foster, Director
February 25, 1975
Page 2

We will be in further contact with you regarding this review.

Sincerely,

A handwritten signature in cursive script that reads "Stephen H. Norris".

Stephen H. Norris
Grant Review Coordinator

SHN: mn

Enclosures



STATE OF TENNESSEE
OFFICE OF URBAN AND FEDERAL AFFAIRS
SUITE 108
PARKWAY TOWERS BUILDING
NASHVILLE 37219

615-741-2714

March 11, 1975

Mr. M. I. Foster, Director
Division of Navigation Development
and Regional Studies
Tennessee Valley Authority
Knoxville, Tennessee 37402

9
RE: DRAFT EIS - TIMBERLAKE NEW
COMMUNITY (correction)

Dear Mr. Foster:

Please note an error in the last paragraph on page three (3) of the comments submitted by the Tennessee Department of Public Health on the above referenced project. This paragraph should read as follows:

"The Division of Water Quality Control uses the instantaneous minimum flow on regulated streams and the three-day minimum, twenty-year recurrence interval flows in unregulated streams in the calculation of receiving stream assimilative capacity. There is a question regarding the minimum continuous flow of some 1,350 cfs discussed in this report. According to USGS records, the minimum instantaneous flow is much lower than the above figure."

Please correct your copy accordingly.

Sincerely,

A handwritten signature in cursive script that reads "Stephen H. Norris".

Stephen H. Norris
Grant Review Coordinator

EAST TENNESSEE DEVELOPMENT DISTRICT
1800 LAKE AVE. KNOXVILLE, TENN. 37916, 615-974-2337

ROANE Harriman Rockwood Kingston	CLAIBORNE New Tazewell Tazewell Cumberland Gap	BLOUNT Alcoa Maryville Townsend Friendsville	ANDERSON Oak Ridge Lake City Clinton Norris Oliver Springs	MONROE Tellico Plains Madisonville Sweetwater Vonore	CAMPBELL Jellico LaFollette Caryville Jacksboro	LOUDON Lenoir City Loudon Greenback Philadelphia	JEFFERSON White Pine Jefferson City Dandridge	SEVIER Sevierville Pigeon Forge Gatlinburg
COCKE Newport Parrottsville	MORGAN Oakdale Wartburg	KNOX Knoxville			GRAINGER Rutledge	HAMBLEN Morristown	SCOTT Oneida Huntsville	UNION Maynard Luttrell

January 24, 1975

Mr. M. I. Foster
 Tennessee Valley Authority
 Division of Navigation Development
 and Regional Studies
 511 Arnstein Building
 501 Market Street
 Knoxville, TN 37902

Dear Mr. Foster

**SUBJECT: Result of Regional Review
 Draft Environmental Statement
 Timberlake New Community**

The East Tennessee Development District has reviewed a draft environmental statement from the Tennessee Valley Authority for the Timberlake New Community. This review was conducted pursuant to provisions of Office of Management and Budget Circular A-95 Revised and pursuant to the Governor's designation of the East Tennessee Development District as a Regional Clearinghouse for review of federally-assisted projects.

The regional review process serves the following purposes:

- (a) To ensure that local governments and other agencies are notified about proposals and projects which may affect them.
- (b) To determine whether such proposals and projects are in conflict with other existing or planned programs.
- (c) To secure comments and recommendations concerning ways in which such conflicts (if any) can be resolved.

A copy of the draft statement was received by the East Tennessee Development District on December 10, 1974. Letters of notification were sent to the following local governments and agencies:

Judge Clyde McMahan, Blount County
 Judge William H. Russell, Loudon County
 Judge J. P. Kennedy, Monroe County
 Mayor Joe D. Grayson, Lenoir City

Mr. M. I. Foster
Page 2
January 24, 1975

Mr. Lee Thompson, Chairman, Lenoir City Regional Planning Commission
Mayor Eugene Lambert, Loudon
Mr. Henry Mitchell, Loudon Regional Planning Commission
Mayor A. J. Kennedy, Vonore
Mr. James F. Isbill, Vonore Municipal Planning Commission
Mayor Tom Peeler, Greenback
Mayor Robert Harrill, Madisonville
Mr. Rex Denton, Madisonville Regional Planning Commission
Mayor George Cansler, Jr., Sweetwater
Mr. Walter Lumsden, Jr., Sweetwater Regional Planning Commission
Mr. David Black, Blount County Regional Planning Commission
Mr. Ben Gaylon, Loudon County Regional Planning Commission
Mr. Walter Lumsden, Jr., Monroe County Regional Planning Commission

East Tennessee Development District review of the draft statement as to the adequacy of the statement as a reflection of the impact on the environment has generated these comments.

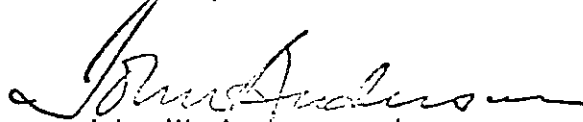
1. The statement seems to cover all of the major issues; however, there is relatively little exact information, due, no doubt, to the fact that the physical appearance and timing of Timberlake is so uncertain. Since this is the case, it is incumbent on the Tennessee Valley Authority and whoever else may be involved to review specific projects and elements of the plan with various local, regional and state agencies as they occur.
2. The statement does not, in a detailed fashion, consider air pollution and storm water runoff.
3. There are other factors like unemployment, underemployment, dangers to some types fish that should be given more attention.

The East Tennessee Development District or other reviewing agencies may wish to comment further at a later time. Several of the local planning bodies due to meeting schedules will be considering the statement at a later time, comment will be relayed if it is received.

Mr. M. I. Foster
Page 3
January 24, 1975

We appreciate the opportunity to work with you in coordinating projects of significance in this region.

Sincerely,



John W. Anderson, Jr.
Executive Director

JWA/JW/kf

cc Mr. George Brummett, Office of Urban and Federal Affairs
Mr. John Mayes, Tennessee State Planning Office
Judge Clyde McMahan, Blount County
Judge William H. Russell, Loudon County
Judge J. P. Kennedy, Monroe County
Mayor Joe D. Grayson, Lenoir City
Mr. Lee Thompson, Chairman, Lenoir City Regional Planning Commission
Mayor Eugene Lambert, Loudon
Mr. Henry Mitchell, Loudon Regional Planning Commission
Mayor A. J. Kennedy, Vonore
Mr. James F. Isbill, Vonore Municipal Planning Commission
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Mr. Rex Denton, Madisonville Regional Planning Commission
Mayor George Cansler, Jr., Sweetwater
Mr. Walter Lumsden, Jr., Sweetwater Regional Planning Commission
Mr. David Black, Blount County Regional Planning Commission
Mr. Ben Gaylon, Loudon County Regional Planning Commission
Mr. Walter Lumsden, Jr., Monroe County Regional Planning Commission

TVA Responses to Comments from
East Tennessee Development District

COMMENT

"1. The statement seems to cover all of the major issues; however, there is relatively little exact information, due, no doubt, to the fact that the physical appearance and timing of Timberlake is so uncertain. Since this is the case, it is incumbent on the Tennessee Valley Authority and whoever else may be involved to review specific projects and elements of the plan with various local, regional and state agencies as they occur."

RESPONSE

TVA agrees! It is believed that the sections, "Public-Private Developer Relationship" and "Planning Activities and Governmental Coordination," on page 5 express TVA's policy position.

COMMENT

"2. The statement does not, in a detailed fashion, consider air pollution and stormwater runoff."

RESPONSE

A discussion of the potential air quality impact of Timberlake is presented on pages 26-27 of the draft statement; also, a short treatment of local meteorological and climatological factors that influence ambient air quality is presented on pages 12 and 13. As indicated on page 26, the air quality impact of sources locating in or near Timberlake will be minimal because the sources will be subject to the air pollution control regulations established under Federal and state laws. Detailed consideration of the quality impact of any industrial sources will be carried out by TVA upon identification of the specific nature of the emissions and prior to making land available for development.

Preliminary analysis by TVA indicates that stormwater runoff from the Timberlake community after development will not vary significantly in character from the runoff from existing forested and agricultural lands.

TVA believes that stormwater runoff from Timberlake will not adversely affect water quality in Tellico Reservoir; however, should water quality studies indicate that controls are needed, they will be provided as required to protect water quality. The stormwater drainage system to be provided to collect runoff from Timberlake will facilitate the management of stormwater runoff if controls are deemed necessary.

COMMENT

"3. There are other factors like unemployment, underemployment, dangers to some types fish that should be given more attention."

RESPONSE

The section, "Socioeconomic Setting," describes the general historic conditions in the Timberlake area which is illustrative of the general lack of adequate employment opportunities. Additional information has been included in the section, "Employment," concerning unemployment and Table 17 has been included illustrating the area's recent unemployment history. The Tellico Project Environmental Statement - OHES-EIS-72-1 (TVA, Chattanooga, Tennessee, February 10, 1972) discusses the impact the impoundment of the Tellico Reservoir will have on types of fish in the Little Tennessee River. As discussed on page 24 of the Timberlake statement, TVA does not expect the development of Timberlake to have any significant adverse impact on the fishery of Tellico Reservoir.

