1.0 INTRODUCTION

TVA is a corporate agency of the United States created by the Tennessee Valley Authority Act of 1933 (48 Stat. 58, as amended, 16 U.S.C. §§ 831-831dd (1970)). In addition to its programs of flood control, navigation, and regional development, TVA operates a power system supplying the power requirements for an area of approximately 80,000 square miles containing about 6 million people. Except for direct service by TVA to certain industrial customers and Federal installations with large or unusual power requirements, TVA power is supplied to the ultimate consumer by 160 municipalities and rural electric cooperatives which purchase their power requirements from TVA. TVA is interconnected at 26 points with neighboring utility systems.

The TVA generating system consists of 29 hydrogenerating plants and 12 fossil-fueled steam-generating plants now in operation. In addition, power from Corps of Engineers' dams on the Cumberland River and dams owned by the Aluminum Company of America on Tennessee River tributaries is made available to TVA under long-term contracts. Figure 1.0-1 shows the location of TVA's present generating facilities and those under construction. The approximate area served by municipal and cooperative distributors of TVA power is also shown.

Power loads on the TVA system have doubled in the past 10 years and are expected to continue to increase in the future. In order to keep pace with the growing demand it has been necessary to add substantial capacity to the generating and transmission system on a regular basis. The TVA system capacity as of June 30, 1973 is shown in Table 1.3-1.

As part of TVA's construction program designed to meet increased requirements for generation, in August 1968 the TVA Board authorized the construction of the Sequoyah Nuclear Plant. An application to construct the plant was filed with the Atomic Energy Commission (AEC) on October 15, 1968. After extensive review of the suitability of the site and the plant design by the AEC regulatory staff and the independent Advisory Committee on Reactor Safeguards, an Atomic Safety and Licensing Board granted a provisional construction permit on May 27, 1970. The Final Safety Analysis Report and a request for authorization to operate the 2-unit plant will be submitted to AEC at a later date. Under the current schedule, TVA expects to be permitted to load the nuclear fuel for unit 1 in December 1975. Full-load operation of unit 1 is expected in June 1976; unit 2 is expected to go into full-load operation in February 1977.

As a Federal agency, TVA is subject to the requirements of the National Environmental Policy Act of 1969 (NEPA) which became effective on January 1, 1970. In carrying out its responsibilities under the TVA Act, TVA follows a policy designed to develop and enhance a quality environment. As a result of this policy, TVA has long considered environmental matters in its decision making. Offices and divisions within TVA employ personnel with a wide diversity of experience and academic training which enables TVA to utilize a systematic, interdisciplinary approach to ensure the integrated use of the natural and social sciences and the environmental design arts in planning and decision making as required by NEPA. The draft statement on the environmental considerations relating to the Sequoyah Nuclear Plant has been sent to state and Federal agencies for review and comment pursuant to NEPA as

implemented by guidelines issued by the Council on Environmental Quality (CEQ) and Office of Management and Budget Circular A-95.

The Sequoyah Nuclear Plant was initiated by TVA before enactment of NEPA, and the TVA Board of Directors has determined that it is not practicable to reassess the basic course of action in the design and construction of this plant. TVA has continued to study the plant design, however, so as to minimize the adverse environmental consequences which could result from the construction and operation of the plant. For example, through a continuing study of alternate methods to reduce the release of radioactivity to the environment, TVA has decided to provide additional holdup for gaseous radwaste and additional processing for the liquid radwaste. These systems will reduce the amount of radioactivity released to the environment substantially below the level which would have resulted from the plant design as approved by AEC for construction. In addition, although the plant was designed to meet the water quality standards which were proposed at the time, more stringent water quality standards have subsequently been adopted, and TVA will backfit natural draft cooling towers in order that the plant will meet the new temperature requirements for the receiving water.

It should be noted that although the two units will begin operation at different times, this environmental statement considers the plant as operating with both units, in order to accurately assess the impact of the plant on the environment and so that consideration of the cumulative effects of the plant can be assured.

This environmental statement provides a baseline inventory of environmental information and covers the environmental considerations

set out in Section 102(2)(C) of NEPA, as implemented by the CEQ and AEC guidelines. After weighing and balancing the environmental costs and the technical, economic, environmental, and other benefits of the project and adopting alternatives which affect the overall balance of costs and benefits by lessening environmental impacts, TVA has concluded that the overall benefits of the project far outweigh the monetary and environmental costs, and that the action called for is the completion of construction and operation of the Sequoyah Nuclear Plant.

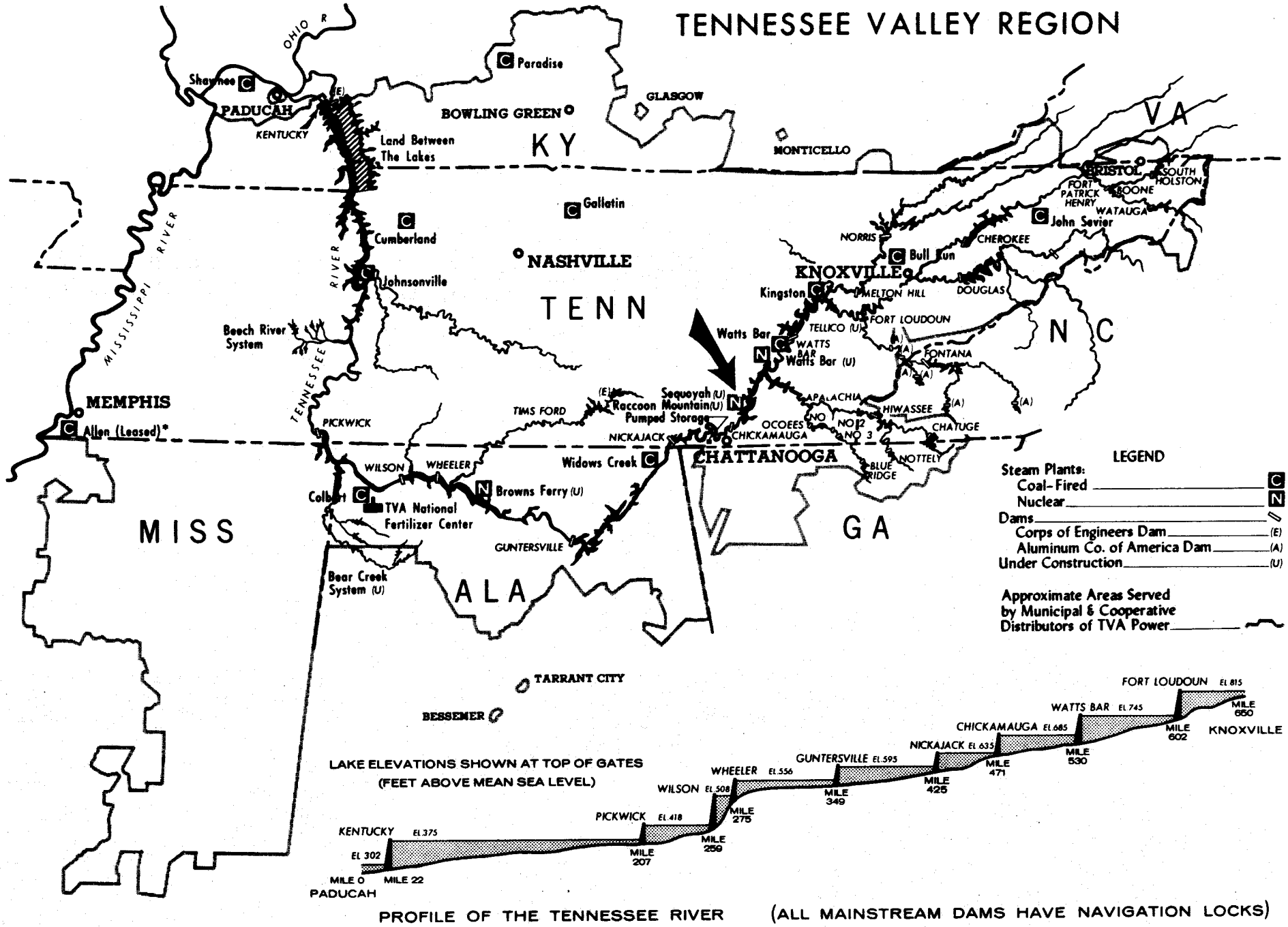


Figure 1.0-1

*Includes gas turbine installation under construction

1.1 General Information - This section provides a basic knowledge of the important characteristics of the Sequoyah plant in order to establish a basis for consideration of the environmental impact of the facility.

1. Location of the facility - The Sequoyah site is located on a tract of land consisting of approximately 525 acres, owned by TVA, on a peninsula at Tennessee River mile (TRM) 484.5 on the west shore of Chickamauga Lake about 18 miles northeast of downtown Chattanooga, Tennessee. The site lies in the Great Valley of east Tennessee, which separates the Blue Ridge Mountains on the east from the Cumberland Plateau on the west. The proximity of the site to local towns, rivers, and state boundaries is indicated on the vicinity map, figure 1.1-1.

2. Physical characteristics of the facility - The plant will have the following principal structures on the site: two reactor containment buildings, turbine building, auxiliary building, two natural draft cooling towers, diesel generator building, service building, transformer yard, 500-kV and 161-kV switchyards, intake structure, condensing water pumping station, and condensing water discharge and diffuser system. Figure 1.1-2 shows the general arrangement of these facilities. Figures 1.1-3 and 1.1-4 show the status of construction during the summer of 1973.

The two reactor containment buildings each house a pressurized water reactor designed and manufactured by Westinghouse Electric Corporation. The 2-unit plant will have a total nameplate electrical generating capacity of approximately 2,441 megawatts. The

nuclear steam supply system for each unit consists of a reactor and four closed-reactor coolant loops connected in parallel to the reactor vessel. Nuclear fuel is contained inside each reactor vessel. The reactor and primary coolant system for each unit will be housed in a cylindrical containment building designed to minimize the escape of any leakage from the primary system to the environment. The fuel is in sealed metal tubes and consists of slightly enriched uranium dioxide pellets. The fission process in the fuel produces heat. Water serves as both the moderator of the fission process and the coolant. The primary coolant water is pumped through the reactor from below the fuel and is heated by contact with the fuel element tubes. The heated coolant flows in four closed-loop circuits through tubes in steam generators and then is pumped back into the reactor. In each steam generator a separate body of water flows in contact with the outside surface of the tubes and absorbs heat from the reactor coolant, producing steam to power the turbine generator. The electrical power thus produced by the turbine generator is distributed to meet the power needs of the TVA system. The reactor power is controlled by control rods, lumped burnable poison rods, and neutron-absorbing boric acid solution. Flaked ice, manufactured at the site and stored in baskets in the ice condenser in the reactor building, will be used to quench any rapid buildup of heat and pressure if steam should escape within the containment vessel. A more detailed description of the plant facilities appears in the preliminary safety analysis report.

TVA also plans to construct on the site a power plant training center. The training center will be used to implement a training program for power plant operators and will consist of nuclear reactor and fossil unit simulators.

The principal ways the plant will interact with the environment, discussed later in detail, are:

1. Releases of minute quantities of radioactivity to the air and water;
2. Release of large quantities of heat and water vapor to the environment; and
3. Change in land use from farming to industrial.

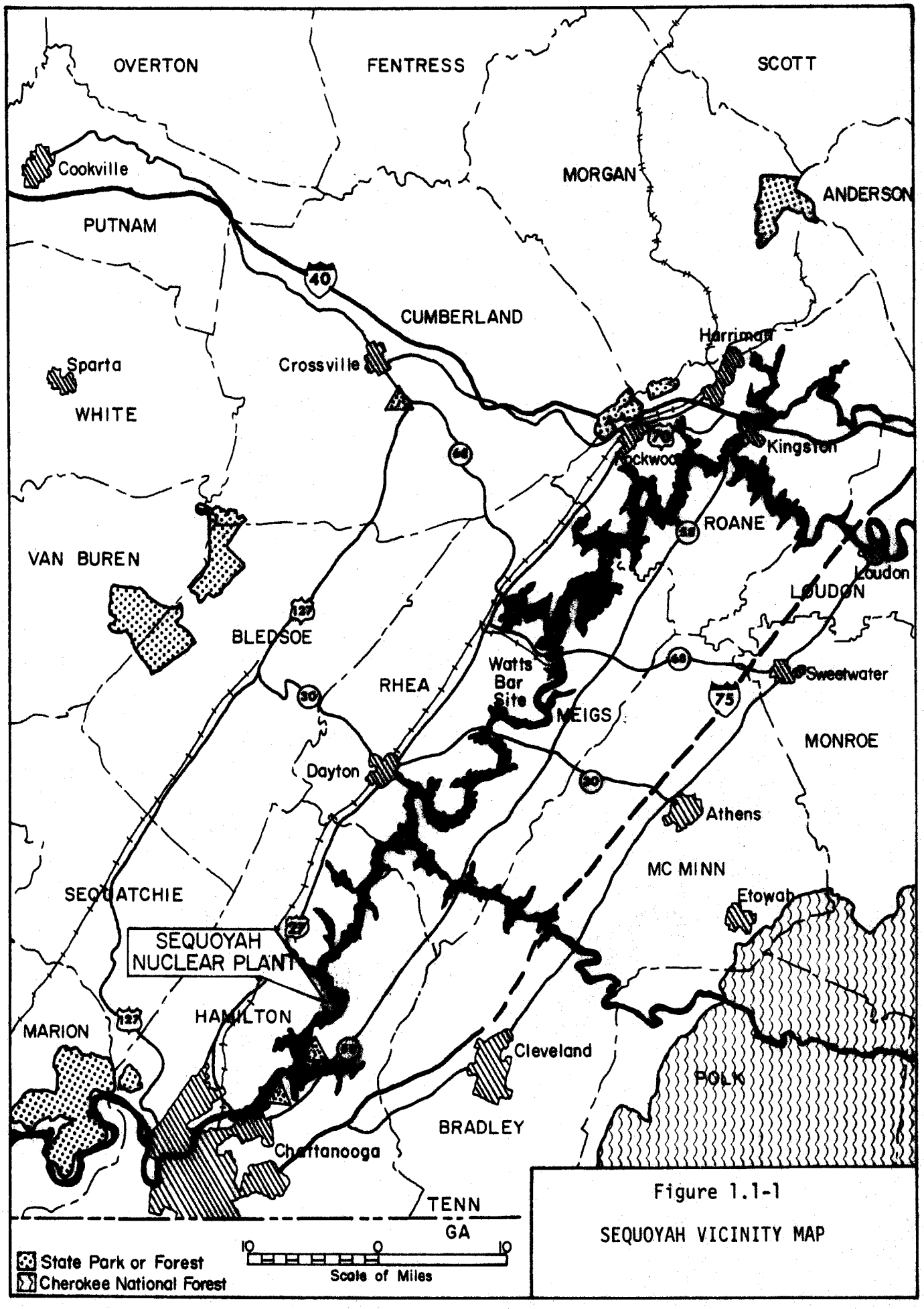


Figure 1.1-1

SEQUOYAH VICINITY MAP

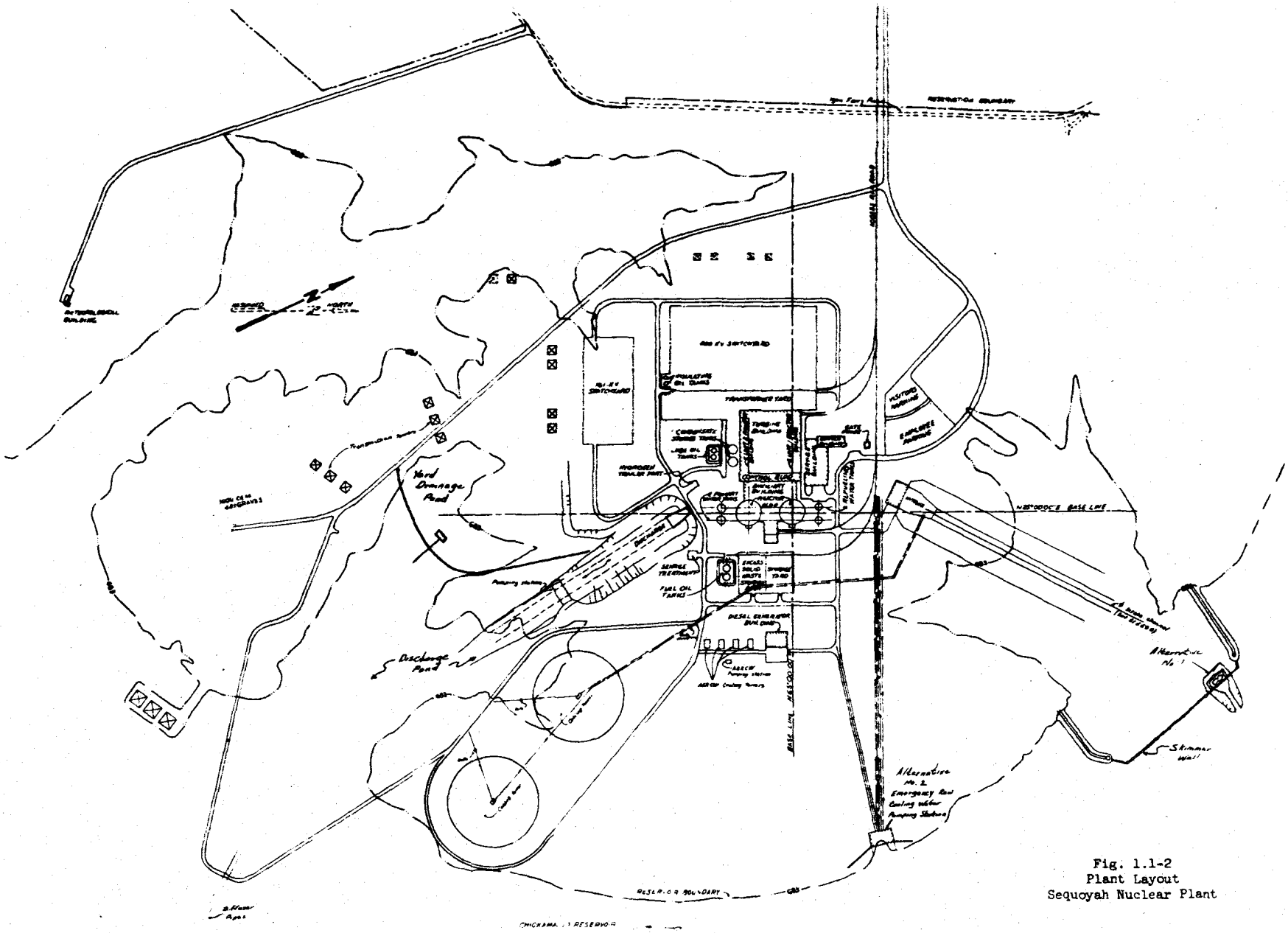


Fig. 1.1-2
Plant Layout
Sequoyah Nuclear Plant

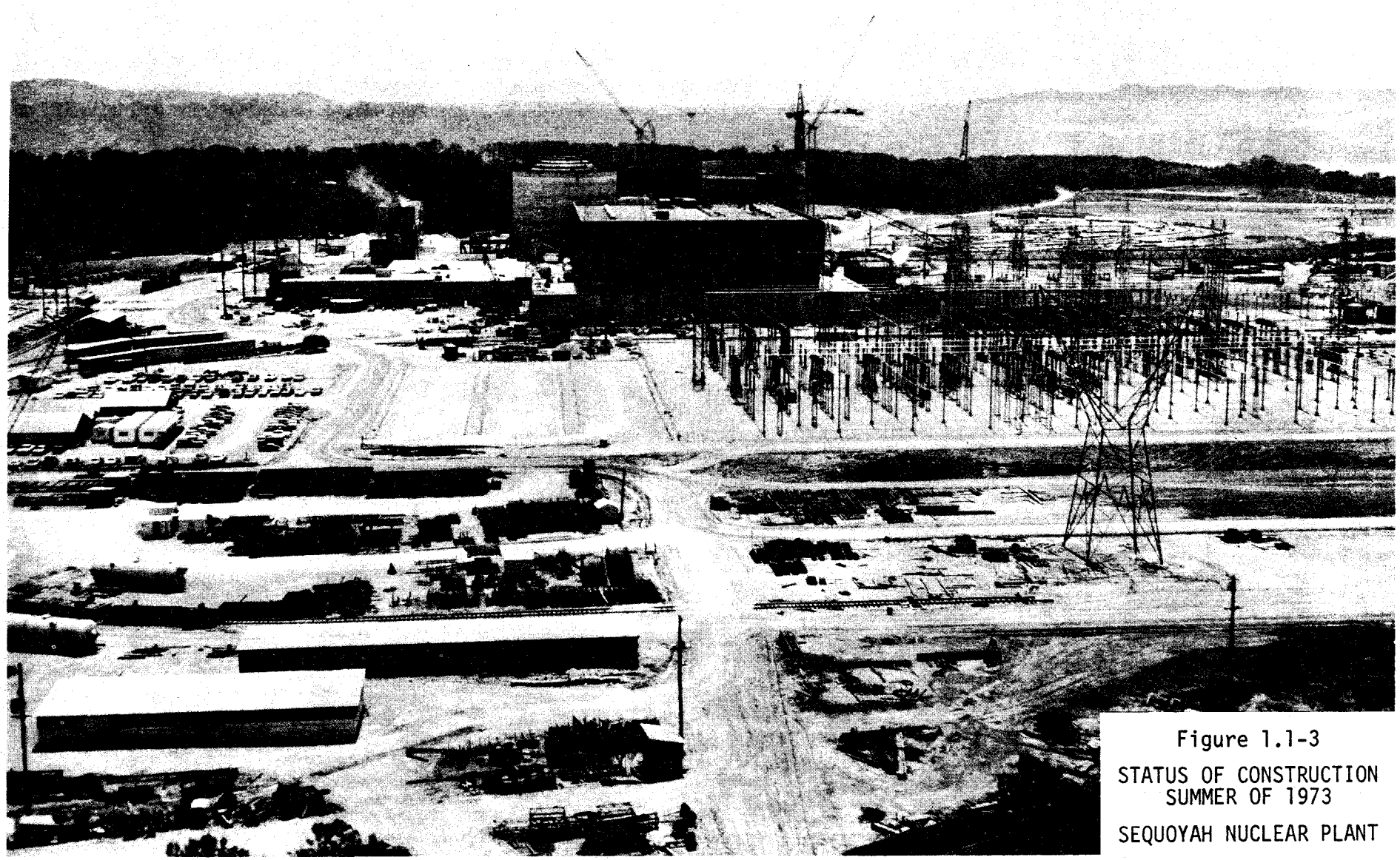


Figure 1.1-3

STATUS OF CONSTRUCTION
SUMMER OF 1973

SEQUOYAH NUCLEAR PLANT

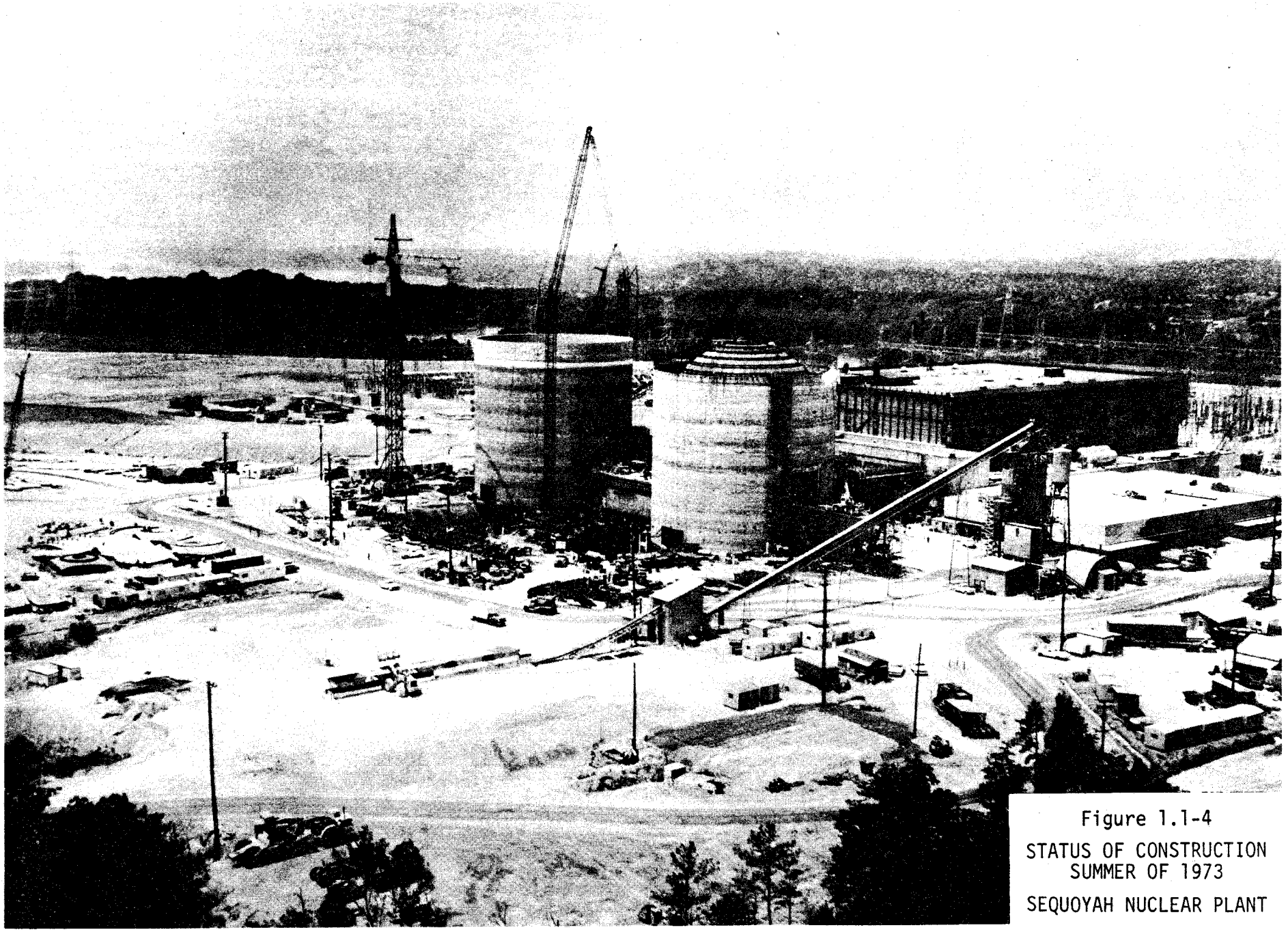


Figure 1.1-4

STATUS OF CONSTRUCTION
SUMMER OF 1973

SEQUOYAH NUCLEAR PLANT

1.2 Environment of the Area - The following description provides a baseline inventory of the important characteristics of the region.

1. History - The Sequoyah Nuclear Plant site is in Hamilton County, Tennessee, about 18 miles upstream of downtown Chattanooga. Hamilton County, named in honor of Alexander Hamilton, was created by an act of the General Assembly of the State of Tennessee on October 25, 1819, from part of the area of Rhea County. The first county seat was at the frontier town of Dallas. In 1840, the seat was moved to Vanville, which was later absorbed by Harrison. Subsequently, the county seat was moved to Chattanooga, where it remains today.

The nuclear plant is named for Sequoyah, a Cherokee scholar and inventor born around 1760 at the Cherokee town of Taskigi. He is noted for the invention of the Cherokee alphabet, which was adopted by the Cherokee Nation in 1821.

2. Topography - The Sequoyah site is a moderately wooded area on a peninsula extending into Chickamauga Reservoir. The nuclear plant is being built west of a natural tree cover. On the site, the land rises from the water surface (normal maximum summer level elevation 682.5 feet above mean sea level) to a small hill crest approximately 750 feet above mean sea level. Across the river, a ridge of small hills rises to approximately 900 feet above mean sea level.

3. Geology - Geological studies of the bedrock at the site show that it is primarily overlain by approximately 45 feet of unconsolidated terrace deposits laid down by the Tennessee River when flowing at a higher level. Drilling has shown that this material consists predominantly of reddish-brown sandy clay in which are embedded

nearest known damaging quake (MM VI) was centered approximately 150 miles east of the site. The intensity felt at the site from the latter quake was at most MM III. Accelerations at the site from a recurrence of these shocks would be far less than the proposed design accelerations. Further details of the seismic history of the site are presented in the Sequoyah Nuclear Plant Preliminary Safety Analysis Report.

5. Climatology and meteorology - This section summarizes the climatology and meteorology of the area. Appendix A contains detailed information for the region and the Sequoyah site and a description of the onsite meteorological program.

The Sequoyah site is in the eastern Tennessee portion of the Southern Appalachian region which is dominated much of the year by the Azores-Bermuda anticyclonic circulation shown in the annual normal sea level pressure distribution (figure 1.2-2).[1] This circulation over the southeastern United States is most pronounced in the fall and is accompanied by extended periods of fair weather and widespread atmospheric stagnation.[2] In the winter, the normal circulation pattern becomes diffuse as the eastward moving migratory high- and low-pressure systems, associated with the midlatitude westerly current, bring alternating cold and warm air masses into the area with resultant changes in wind direction, wind speed, atmospheric stability, precipitation, and other meteorological elements. In summer, the migratory systems are less frequent and less intense, and the area is under the dominance of the western edge of the Azores-Bermuda anticyclone with a warm moist air influx from the Atlantic Ocean and the Gulf of Mexico.

The predominate air masses affecting the Sequoyah site may be described as interchangeably continental and maritime in winter and spring, predominantly maritime.

rounded cobbles and pebbles of quartzite, quartz, and chert. In the area not mantled by terrace deposits, bedrock is overlain by varying thicknesses of residual silt and clay derived from the total weathering of the underlying shale and limestone.

Beneath the terrace cover are the interbedded limestone and shales of the Conasauga Formation of Middle Cambrian Age (figure 1.2-1). Stratigraphically, the Conasauga is overlain to the southeast by 2500 to 3000 feet of massive limestone and dolomite of the Knox Group and is underlain to the northwest by 800 to 1000 feet of sandstone and shale of the Rome Formation. During the geologic past, folding and faulting has compressed the Conasauga Formation between the more competent overlying Knox and underlying Rome Formations.

The Conasauga Formation will provide a satisfactory and competent foundation for the plant structures. Cores from holes drilled in the plant area indicate no evidence of weathering below the upper five feet of the rock which will be removed under normal construction procedures. Physical testing, both static and dynamic, has shown that the unweathered rock is capable of supporting loads in excess of those that will be imposed by the plant structures. The Conasauga Formation at the site is relatively unfossiliferous and has no known areas of unique paleontologic significance.

4. Seismology - The site lies within the borders of the Southern Appalachian seismotectonic province. Figure 1.2-1 locates the nearest faults in the region, all of which are tectonically inactive.

The nearest local quake with a Modified Mercalli intensity of V was centered about 20 miles southwest of the site. The

in the summer, and continental in the fall. Data collected over a thirty-year period at the Chattanooga airport indicate the average annual temperature is 61.2°F., with monthly averages ranging from 41.7°F. in January to 80.7°F. in July. The maximum annual range, from 106°F. in July to -7°F. in January, is 113°F. Detailed temperature data for Chattanooga are shown in Table 1.2-1. Table 1.2-2 shows the air temperature data collected at the Sequoyah Environmental Data Station from April 1971 to March 1972.

The probability of tornado occurrence at the site is extremely low. For about a half-century, 1916-1972, there have been no tornadoes recorded in Hamilton County.[3,4,9] Tornadoes in the area generally moved northeastward up the valley, covering an average surface path 5 miles long and 100 yards wide.[3] Severe windstorms may occur several times a year, particularly during winter, spring, and summer, with winds reaching 35 mi/h and on occasion exceeding 60 mi/h. High wind may accompany moderate-to-strong cold frontal passages 20 to 30 times a year, with maximum frequency in March and April. High winds may also accompany thunderstorms which occur approximately 56 times a year, with maximum frequency in July.[4]

About 60 percent of the annual average precipitation in the site area results from migratory storms in late November through April with March usually having maximum amounts. Minimum precipitation is normally in October. Detailed precipitation information is shown in Table 1.2-3. Table 1.2-4 contains snowfall data.

Table 1.2-5 shows the frequency of fogs for Chattanooga and indicates that heavy fogs (visibility equal or less than 1/4 mile) occur on 36 days annually with a maximum of 6 days in October and a minimum of 2 days from February through July.

The data for the first year of onsite meteorological monitoring identify reasonably well the expected wind conditions in the plant site area (Tables 1.2-6 and 1.2-9). Normal vs. extreme conditions cannot be precisely determined from a single year of data, but subsequent onsite data support the wind patterns found in the first year. Comparative data from Chattanooga and Knoxville airports, Kingston Steam Plant, and Oak Ridge National Laboratory show a predominant northeast-southwest wind direction alignment. These data are considered indicative of local wind patterns. Representative data also indicate that the highest occurrence of directional persistence is with southwest winds, in agreement with data for the Sequoyah site in Table 1.2-6. A spring wind speed of 7-9 mi/h and a fall wind speed of 5-6 mi/h are indicated in Tables 1.2-7 and 1.2-8 (data from Chattanooga and Knoxville, respectively). The Sequoyah data show the predominant northeast-southwest wind direction alignment, with a tendency toward north-northeast and south-southwest. Additional data are contained in Appendix A.

A breakdown of the estimated occurrence of the individual stability categories, A through G, with respect to wind direction and wind speed is shown in Appendix A. Most significant is the percent occurrence of the 0-3.4 mi/h wind speed range for the F and G categories which are usually identified with the most adverse onsite atmospheric dispersion conditions. The respective values are about 13 and 6 percent.

6. Hydrology and water quality

(1) Ground water - Ground water at Sequoyah is derived principally from precipitation which, over the past 20 years of record, has averaged 58 inches per year. There is

no distinct aquifer in the Conasauga Formation at the Sequoyah site. The shales and limestones are essentially impervious and the majority of the ground water flows through the terrace deposits overlying bedrock with some flow through fractures and cracks in the rock surface. Water level readings made in the exploration holes show that the water table stands approximately 20 feet above rock in the terrace material. The gradient of the water table slopes toward the reservoir. Thus, ground water movement in the area is from the plant site to the Tennessee River. Drilling of exploratory holes in the site area disclosed no indication of extensive cavities or solution channels in the Conasauga Formation.

(2) Surface water - Surface water is derived from precipitation remaining after losses due to evaporation and transpiration. It can be generally classified as local surface runoff or streamflow.

(a) Reservoir description - The site is located about 13 miles upstream of Chickamauga Dam. The Tennessee River at Chickamauga Dam has a drainage area of 20,790 square miles. Chickamauga Reservoir is TVA's sixth largest reservoir by area at normal full pool elevation of 682.5 feet. At this elevation the reservoir is 58.9 miles long on the Tennessee River and 32 miles long on the Hiwassee River, with an area of 35,400 acres, a volume of 628,000 acre-feet, a shoreline length of 810 miles, and a width which ranges from 700 feet to 1.7 miles. At the site, it is about 3,000 feet wide, with cross-sectional depths ranging up to 50 feet at normal pool elevation (see figure 2.6-2). Navigation is provided by maintaining a minimum channel depth of nine feet. Flow is in a general southwesterly direction.

(b) Streamflow - Records maintained at Chickamauga Dam for 1940 to 1970 show an average discharge at

the dam of 32,800 ft^3/s. Flow data for water years 1951-1972 indicate an average flow of about 27,600 ft^3/s during the summer months (May-October) and about 38,500 ft^3/s during the winter months (November-April). The maximum daily discharge was 219,000 ft^3/s on March 18, 1973. Except for two special operations on March 30 and 31, 1968, when discharge was zero to control milfoil, the minimum daily discharge was 700 ft^3/s on November 1, 1953. Flow durations based upon mean daily discharges from Chickamauga Dam for the period 1951-72 are tabulated below.

Mean Daily Discharge, ft^3/s	Percent of Days Mean Daily Discharge Is Equaled or Exceeded
5,000	99.6
10,000	97.7
15,000	93.3
20,000	84.0
25,000	69.3
30,000	46.8
35,000	31.7

The frequency of hourly flows and the duration of zero flow periods for the Watts Bar Dam (upstream of the site) and the Chickamauga Dam (downstream of the site) are shown by figures 1.2-3 and 1.2-4 and by Table 1.2-10.

Channel velocities at the plant site average 0.6 foot per second under normal winter flow conditions and 0.3 foot per second under normal summer conditions.

(c) Water quality - A yearlong water quality survey of Chickamauga Reservoir was made by TVA beginning in May 1960. Detailed discussions of the sampling locations, frequency and the results are included in the report "Quality of Water in Chickamauga Reservoir."[5] Although the data in this report were collected in 1960 and 1961, there have been no upstream developments that would have significantly altered

the water quality of Chickamauga Reservoir between 1960 and 1973. Thus, the 1960-61 data still accurately reflect the present water quality characteristics that would be expected in Chickamauga Reservoir. The results of the 1971 yearlong water quality survey of Fort Loudoun Reservoir, the second reservoir upstream of Chickamauga Reservoir, support this conclusion.

In general, the bacteriological quality of water in Chickamauga Reservoir was found to be good. The water at Hamilton County Park, 5 river miles below the plant site, was of exceptionally good bacteriological quality. Monthly sanitary-chemical analyses of samples from 13 stations show the water in the main stem of the reservoir to be relatively low in organic content. Color and odor concentrations were also low. The mineral quality of water in Chickamauga Reservoir was determined by monthly samples collected from four locations in the reservoir. The water in the main stem of the Tennessee River portion of Chickamauga Reservoir during the sampling period was moderately hard (about 60 to 80 mg/l) but satisfactory for practically all industrial uses. The water quality data observed at a sampling point 12 miles downstream from the plant site are shown in Table 1.2-11.

TVA and the Tennessee Division of Water Quality Control monitored Chickamauga Reservoir for mercury in the summer and fall of 1970, respectively. Of a total of 55 samples, 54 had mercury levels less than 0.5 μg/l (one-tenth the maximum allowable concentration in drinking water). One TVA sample showed a mercury concentration of 3.8 μg/l. A subsequent sample at the same location about a month later yielded a mercury concentration of less than 0.5 μg/l.

The concentrations of heavy metals that have been observed to occur in the waters of Chickamauga Reservoir at the location of the Sequoyah water intake (TRM 484.1) are shown in Table 1.2-12.

Results of radiological analyses for January and April 1971 showed that gross beta activity upstream at Watts Bar Dam discharge was 3.9 pCi/l and 3.7 pCi/l, respectively. Downstream at Guntersville Dam for the same period the values were 3.2 pCi/l and 4.1 pCi/l, respectively. Radioactivity was well below the safe levels for drinking water recommended by the U.S. Public Health Service.

Water temperature observations at selected Tennessee River stations were included in the data collected during the water quality surveys. These observations indicate that Chickamauga Reservoir is weakly stratified during summer months. Table 1.2-13 summarized the water temperatures recorded at the thermal monitor installed to collect preoperational data. Water temperature and dissolved oxygen observations from an early survey are shown in Table 1.2-11.

Since 1960, TVA has been monitoring on a weekly basis, the dissolved oxygen concentrations in the releases from its hydro projects. Observations of DO concentrations in the Chickamauga Reservoir above and below the Sequoyah site indicate that in the summer months DO concentrations are not at saturation. Minimum dissolved oxygen concentrations in the releases from Chickamauga Reservoir of less than 5.0 mg/l have been observed to occur during six of the years during the period 1960-1972. During two of these six years, the lowest DO concentrations were less than 4.0 mg/l (3.2 mg/l in 1969 and 3.5 mg/l in 1966). The periods of DO less than 5 mg/l ranged in length from a minimum of 2 consecutive days (1971) to a maximum of 44 consecutive days (1969) and averaged about 13 consecutive days.

The DO concentrations of the releases from Hales Bar Dam located downstream from Chattanooga were less than 5 mg/l during seven of the years between 1960 and 1967. The lowest DO concentration of 3.2 which occurred in 1966 corresponds to a period of low DO concentrations (lowest observed 3.5 mg/l) in the releases from Chickamauga Dam.

In late 1967, Hales Bar Dam was replaced by Nickajack Dam, located about six river miles downstream from Hales Bar Dam. The DO concentration in the releases from Nickajack Dam were below 5 mg/l during three of the five years 1968 through 1972. The lowest observed DO concentration in Nickajack releases was 4.5 mg/l.

The principal reasons for the low dissolved oxygen concentrations (below 5 mg/l) occurring in the Hales Bar

Reservoir (now Nickajack Reservoir) are: (1) inadequate waste treatment of organic waste discharges originating from the metropolitan Chattanooga area, and (2) the release of water having less than 5 mg/l DO from Chickamauga Reservoir. In 1964, the total organic waste load discharged to surface streams in the Chattanooga area was about 53,000 pounds of five-day 20°C BOD (about 318,000 population equivalents).[6] With the installation of secondary treatment in 1971 by the city of Chattanooga and improved levels of industrial waste treatment made in the area in recent years, this load has been reduced to about 25,000 lbs. BOD per day. TVA is now investigating methods of increasing the DO levels in the releases from its headwater reservoirs.

(3) Water use - From its head near Knoxville to Kentucky Dam near its mouth, the Tennessee River is a series of highly controlled multiple-use reservoirs. This chain of reservoirs provides flood control, navigation, generation of electric power, sport and commercial fishing, industrial and public water supply, waste disposal, and recreation.

There are four public water supplies taken from Chickamauga or Nickajack Reservoirs within the reach from Dayton, Tennessee, 15.8 miles upstream of the site, to Chattanooga, 19 miles downstream of the site. The present water supply intake for the Tennessee-American Water Company, which serves a population of about 290,000 in the metropolitan Chattanooga area, is located in the headwaters of Nickajack Reservoir approximately 19 miles downstream from the site and 6 miles downstream from Chickamauga Dam. The Daisy-Soddy-Falling Water Utility District, which serves about 8,000 people, has a water intake on Soddy Creek embayment of Chickamauga

Reservoir above the plant site. The closest water supply is Savannah Valley Utility District at TRM 483.6, essentially across the reservoir from the plant. This intake will be relocated prior to operation of the plant. The East Side Utility District had developed plans to locate a surface water supply intake on the Wolftever Creek embayment of Chickamauga Reservoir about 9 miles downstream from the site. However, the district has subsequently decided to continue using its present ground water supply (wells) and has abandoned any definite plans to develop a surface water supply in the foreseeable future. In May 1973, approximately 67 percent of the East Side Utility District distribution system was purchased by the Tennessee-American Water Company of Chattanooga. There are eight public ground water supplies within a 20-mile radius of the proposed site. Public water supply information is included in Table 1.2-14 and the locations are shown on figure 1.2-5.

There are six industrial water supplies taken from Chickamauga or Nickajack Reservoirs near Chattanooga between Tennessee River mile 473 and mile 454.2. In addition, three industrial water supplies are taken from surface streams and ponds, and 24 industrial water supplies are taken from wells within a 20-mile radius of the plant site. Industrial water supplies are shown in Table 1.2-15. Those industrial supplies marked with a triple asterisk also use the supply for potable water within the plant. All other industrial users purchase potable water and water added to consumer products from public utilities.

7. Land use - The site is within the suburban fringe developing around the metropolitan Chattanooga area. Figure 1.2-6 shows the land use characteristics in the area of the Sequoyah site. North and east of the plant site, development is sparse and would generally be classified as "rural nonfarm." Figure 1.2-7 shows the scope and type of development anticipated in the area around the plant by the year 2000. The map is based on land use plans prepared for Hamilton and Bradley Counties by the Chattanooga-Hamilton County Planning Commission and the Tennessee State Planning Commission, respectively. TVA consulted with these agencies in adjusting their planning horizon to the year 2000. Specific land uses in the surrounding area are discussed below.

(1) Industrial operations - No significant industrial development is located in the immediate vicinity of the Sequoyah plant site. Chattanooga is an industrial center southwest of the site, and Cleveland, 13 miles to the east-southeast, is a diversified light industrial center. One of the nearest larger industrial operations in the area is the Volunteer Army Ammunition Plant, with an 8000-acre site and employment of around 2500 people. It is located northeast of Chattanooga and approximately 10 miles southwest of the plant site.

(2) Farming - According to the 1969 Census of Agriculture, 21.9 percent of the land in Hamilton County was in farms. The average size of the 679 farms was 113 acres and only 2 were 200 acres or more. Gross sales from farm products were approximately $5.9 million for an average of about $8700 per farm.

No type of farm specialization was apparent since 62 percent were grouped under "Miscellaneous and

Unclassified Farms." Four-hundred sixteen farm operators reported working off the farm for 100 days or more.

(3) Transportation - A highway parallels each side of the Tennessee River. U.S. Highway 27 to the west and Tennessee Highway 58 to the east are both within 5 miles of the plant site. The Southern Railway runs adjacent to U.S. 27. The nearest major airport is in Chattanooga about 15 miles southwest of the site. Barge traffic on Chickamauga Reservoir is discussed below.

(4) Recreation - Chickamauga Reservoir attracts water-based recreation, particularly from April to October. Recreational facilities include Harrison Bay and Booker T. Washington State Parks; Hamilton County Park; Dayton and Soddy municipal parks; several commercial marinas, boat docks, and resorts; private and public clubs; and a system of public assess areas. Four private clubsites, situated on the shore of Chickamauga Lake, are within one mile of the plant site. A public use area with minimum facilities (boat launching ramp and parking area) is located just across the lake from the site.

(5) Wildlife preserves - The Sequoyah site is approximately three miles downstream of the Soddy Creek waterfowl management area. It is also approximately 15 miles downstream of the Hiwassee Island Refuge, the principal waterfowl unit on Chickamauga Reservoir.

(6) Population distribution - Much of Chattanooga's suburban growth has been toward the plant site along existing highways and the reservoir shoreline. On the northwest side of the reservoir, scattered subdivisions extend out to within 2 miles

of the plant site. On the other side much denser development has occurred between the Volunteer Army Ammunition Plant and Chattanooga's city limits.

To the north and west, the area is rural in nature and is characterized by scattered individual homes. Tables 1.2-16 and 1.2-17 show the detailed distribution of the 1970 population within 10 miles and 50 miles of the plant site respectively. Figure 1.2-8 shows the major population areas near the plant site. Tables 1.2-18 through 1.2-25 show the projected population distributions within both 10 miles and 50 miles of the plant site for the years 1980, 1990, 2000, and 2010.

(7) Waterways - Tennessee River traffic, measured at the Chickamauga Lock, amounted to 756 thousand tons in 1969, exclusive of sand and gravel. In 1970 barge traffic had increased 2 percent to 769 thousand tons. Total tonnage for the Tennessee River in 1969 was 24.5 million tons, with 1970 tonnage estimated to be 25.4 million tons. Estimates indicate that Tennessee River traffic will experience an average growth rate of about 4.8 percent annually to 1980, when it will reach 40.5 million tons.

(8) Government reservations and installations - Approximately 13 miles southwest of the Sequoyah plant site is the Chickamauga Dam and Reservation. The Nickajack Dam and Reservation is approximately 35 miles southwest of the site. Approximately 32 miles north of the plant site is the Watts Bar Reservation, which includes the Watts Bar Dam and Steam Plant, and Watts Bar Nuclear Plant (under construction). Ten miles southwest of the site is the Volunteer Army Ammunition Plant.

8. Ecology - The site environs provide a diversity of habitat situations which support a variety of terrestrial and aquatic fauna and flora. A more complete discussion of ecological data, species lists, and sampling information appears in Appendices B and C. No rare or endangered species are known to nest on the area or are expected to be threatened by plant construction and operation.

(1) Aquatic Ecology - The reservoir in the vicinity of the site includes areas of varying depth, blind nonflowing embayments, tributary streams, peninsulas, inundated reservoir shallows, and the navigation channel (old riverbed). The area is characterized by embayments and shallow overbanks which alternate between right and left banks as the channel changes course. There are extensive shallow areas approximately two to four miles downstream from the plant site.

There are a variety of benthic substrates in the area. They range from bedrock to fine organic leaf fragments. The substrate of greatest areal extent is composed of mixed sand, clay, and silt.

(a) Fish - Fish sampling in Chickamauga Reservoir has been conducted intermittently since 1942. Preoperational monitoring was begun in 1970 and has continued to present. Current results of the fish monitoring program are analyzed elsewhere (Appendix B) along with a cursory discussion of some historical data. Although larval fish sampling was begun in March 1973, no analyses have yet been performed. Estimations of larval fish abundance, therefore, were made using data from Wheeler Reservoir (Appendix B). Prior to impoundment of the large

cove which will be used as a discharge pond at the Sequoyah Plant, all fish were removed and enumerated by TVA fisheries biologists. These results are also discussed in Appendix B.

The piscine community of Chickamauga Reservoir is dominated by gizzard and threadfin shad, as expected in Tennessee River main stream impoundments. Rough fish, particularly carp, drum, and small buffalo, also contribute significantly to standing crop (biomass) estimates. Among the sport fish, largemouth and spotted bass, bluegill, redear, and longear sunfish are abundant, but smallmouth bass and walleye are rare. Latest available TVA data (1972) indicate a commercial harvest of 373,000 pounds of fish, primarily catfish, buffalo, and carp.

(b) Mussels - In the past mussel harvests have been an important river harvest, but there have been no harvests from Chickamauga Reservoir since 1970 when about $3,000 worth of pigtoe mussel shells were harvested. A 3-mile stretch of the river has been designated a mussel sanctuary by the State of Tennessee but this area is over 40 river miles above Sequoyah. The closest area to the Sequoyah site harvested for mussels in recent years is 24 miles upstream (TRM 509).

(c) Other aquatic life - There is an abundance of other aquatic life in the reservoir. The dominant spring and fall phytoplankter is typically a species of *Melosira*. The summer flora is dominated by two or three species of green algae. Blue green algae are represented but are not abundant. A large portion of zooplankton density is comprised of rotifers. However, calanoid copepods and cladocerans are also plentiful. Lists of plankton and

macrophytes are available from TVA's Division of Environmental Planning, Chattanooga, Tennessee.

As a rule, bottom fauna communities are not diverse and species populations are small. An exception is the Asiatic clam (Corbicula), which achieves densities of 2,000/m^2 downstream in limited areas. Densities are much less in the other areas of the reservoir. The most abundant insects are the burrowing mayfly Hexagenia bilineata and midges of the family Chironomidae.

(d) Aquatic macrophytes - Native, rooted, vascular macrophytes are not extensively represented in Chickamauga Reservoir. The reservoir reach above the plant site and some of the adjacent embayments have scattered colonies of coontail, potamogetons, and cattails. An Eurasian watermilfoil chemical control program was last conducted in 1966 on portions of the upper pool of Chickamauga Reservoir but no subsequent problems with this invasion species have been encountered. Very few submersed or emergent macrophytes occur in the immediate area of the Sequoyah site.

(e) Waterfowl - The Sequoyah site is approximately three miles downstream from the Soddy Creek Waterfowl Management Area. The site is also approximately 15 miles downstream from the principal waterfowl unit on the reservoir, Hiwassee Island Refuge. Macrophyte food and overhanging and emergent plant cover are not abundant at the plant site and few waterfowl are observed at the site.

The average daily number of waterfowl estimated on Chickamauga Reservoir during the winter of

1969-1970 was 3,560 ducks and 2,730 Canada Geese. A midwinter inventory (January 1970) tallied 6,120 ducks and 5,400 geese. The waterfowl resource furnishes approximately 5,000 man-days, of hunting recreation annually.

(2) Terrestrial ecology - Approximately 60 percent of the county is forested, 25 percent is unspecified farming with the majority of land pastured, 6 percent is covered by water, and 9 percent is urban associated development, transportation corridors, utility right-of-ways, or unclassified. Much of the county terrain is rugged or lacks good access. Evaluation of habitat for game animals in the Bradley-Hamilton County unit for seven species is shown in Table 1.2-26. Evaluations were based on several factors, including type, distribution and quality of food and cover, and availability of nesting habitat and den sites. The largest deer populations are located along the western border of Hamilton County (Waldens Ridge) and in the northwestern corner of Hamilton County near the junction of the Hiwassee and Tennessee Rivers. Good squirrel populations occur in large stands of hardwoods, while raccoon and rabbits are most common in the wide, rolling valleys between the ridges.

The mixture of forest and open vegetative types and large degree of openness within the forest provide an abundance of niches favoring a diverse bird population. The diverse habitat types surrounding the plant site support varied and abundant populations of snakes, frogs, salamanders, and other herptiles.

A 1969 survey[7] of the Bradley-Hamilton County unit indicates that approximately 60 percent of the land area is forested, 34 percent was nonforested, and 6 percent was covered by water.

Extent and type of forest cover is shown in figure 1.2-9. Hamilton County contained 209,100 acres of forest. Volume of growing stock was estimated to be 233.7 million cubic feet, with 46.5 percent softwoods and 53.5 percent hardwoods. Appendix C provides a description of onsite vegetation before and after construction.

(3) Rare and endangered species - It is conceivable that several species listed by the Department of the Interior Office of Rare and Endangered Species[8] as threatened (rare and endangered) could be found in the area at certain times of the year. The Southern Bald Eagle is occasionally seen on Chickamauga Lake. The American Peregrine Falcon and Northern Red-Cockaded Woodpecker are two endangered avian species that have been observed in east Tennessee. A species commonly seen which is not listed as rare or endangered by the Department of the Interior, but is rapidly decreasing in numbers is the Osprey. Ospreys have been known to nest on channel marker buoys in Chickamauga Reservoir.

9. Historical and archaeological significance of the site - The project has been reviewed by the Tennessee Historical Commission and no properties on the National Register of Historic Places that would be affected by the Sequoyah Nuclear Plant were identified.

Unfortunately, due to an oversight, an archaeological survey was not conducted prior to the initiation of construction activities. Investigations to determine the archaeological significance of the site were conducted after construction was under way and are discussed in Section 2.9, Other Impacts.

REFERENCES FOR SECTION 1.2

1. U. S. Atomic Energy Commission, ORO-99, A Meteorological Survey Oak Ridge Area, November 1953, page 377, Weather Bureau, Oak Ridge, Tennessee.

2. U. S. Atomic Energy Commission, ORO-99, A Meteorological Survey of the Oak Ridge Area, November 1953, page 192, Weather Bureau, Oak Ridge, Tennessee

3. Communications With John Vaiksnoras, State Climatologist for Tennessee, Nashville, Tennessee, August 3, 1972 by TVA staff personnel.

4. "Local Climatological Data With Comparative Data," 1972, Chattanooga, Tennessee, U.S. Department of Commerce, NOAA, EDS.

5. Tennessee Valley Authority, Division of Health and Safety; Environmental Hygiene Branch, Quality of Water In Chickamauga Reservoir, July 1964.

6. Stream Pollution Survey of the Chattanooga Area - 1964, Tennessee Department of Public Health, Stream Pollution Control Division, page iii.

7. Tennessee Valley Authority Division of FFWD. Forestry Bulletin 143, June 1969.

8. U.S. Department of the Interior, Fish and Wildlife Service, Resource Publication 114, Threatened Wildlife of the United States, 1973.

9. U.S. Department of Commerce, Storm Data, NOAA, EDS., Asheville, North Carolina.

Table 1.2-1

AIR TEMPERATURE DATA*

CHATTANOOGA

Month		Average Temp.(1) °F	Average Max. Temp.(1) °F	Average Min. Temp.(1) °F	Extreme Max. Temp.(2) °F	Extreme Min. Temp.(2) °F
Dec.		42.5	50.5	34.4	78	-2
Jan.		41.7	49.9	33.4	78	-10
Feb.		44.4	53.1	35.6	78	1
	Winter	42.9	51.2	-	-	-
March		51.2	61.1	41.2	87	8
April		60.9	72.0	49.8	93	27
May		70.1	80.9	59.3	99	34
	Spring	60.7	71.3	-	-	-
June		78.1	88.3	67.8	104	41
July		80.7	90.0	71.4	106	51
Aug.		79.8	89.3	70.2	105	50
	Summer	79.5	89.2	-	-	-
Sept.		73.8	84.2	63.4	102	36
Oct.		62.1	72.9	51.3	94	22
Nov.		49.4	59.5	39.2	84	4
	Fall	61.8	72.2	-	-	-
	Annual	61.2	71.0	51.4	106 (3)	-10 (4)

* "Local Climatological Data with Comparative Data," 1972, Chattanooga, Tennessee, U.S. Department of Commerce, NOAA, EDS.

(1) Climatological Standard Normals (1931-60)

(2) Period of Record, 1940-72

(3) July 1952

(4) January 1966

Table 1.2-2

AIR TEMPERATURE DATA*

SEQUOYAH NUCLEAR PLANT

APRIL 2, 1971-MARCH 31, 1972

Month		Average Temp. °F	Average Maximum Temp. °F	Average Minimum Temp. °F	Extreme Maximum Temp. °F	Extreme Minimum Temp. °F
Dec.		49.0	56.2	42.3	72.0	23.3
Jan		42.7	52.2	33.5	71.3	2.9
Feb.		40.1	49.7	30.8	74.8	15.2
	Winter	43.9	52.7	35.5	74.8	2.9
Mar.		48.7	59.3	38.6	75.8	26.4
Apr.		59.2	72.8	45.9	86.0	33.1
May		64.6	75.8	54.2	84.9	38.2
	Spring	57.5	69.3	46.2	86.0	26.4
June		75.4	86.7	66.6	96.3	55.3
July		75.4	83.4	68.7	90.8	61.8
Aug.		75.5	86.1	68.0	91.4	59.7
	Summer	75.4	85.4	67.7	96.3	55.3
Sept.		72.4	82.8	63.6	95.1	53.4
Oct.		64.7	74.9	57.3	87.0	43.1
Nov.		48.8	58.8	41.0	78.0	29.2
	Fall	61.9	72.1	53.9	95.1	29.2
	Annual	59.7	69.8	50.8	96.3	2.9

* Temperature instrument 4 feet aboveground

Table 1.2-3

PRECIPITATION DATA*

Month		Average No. of Days with 0.01 inch or more	Monthly Average (inches)	Extreme Monthly Average (inches)	Extreme Monthly Minimum (inches)	Max. in 24 Hrs. (inches)
Dec.		10	5.40	12.15	0.82	3.02
Jan.		12	5.99	13.61	2.35	3.88
Feb.		11	5.82	11.41	2.43	3.08
	Winter	33	17.21			
March		12	6.76	15.22	2.60	6.08
April		10	4.70	10.88	1.18	2.62
May		9	3.87	7.53	1.41	2.75
	Spring	31	15.33			
June		9	4.16	7.20	0.59	2.60
July		11	5.34	11.31	0.74	2.98
Aug.		10	3.91	8.01	1.90	7.56
	Summer	30	13.41			
Sept.		7	4.02	15.40	0.83	4.27
Oct.		7	2.86	9.63	0.09	2.24
Nov.		9	4.86	16.58	0.95	3.21
	Fall	23	11.74			
	Annual	117	57.69			

* TVA Raingage Station 685, Friendship School, Tennessee, located about 2½ miles north-northeast of Sequoyah site; period of record 20 years since station activation April 30, 1948.

Table 1.2-4

SNOWFALL DATA*

(1931-1972)

Month	Snowfall (inches) Mean Total	Maximum Total	Maximum Total in 24 Hours
January	1.8	8.4	8.4
February	1.2	10.4	8.7
March	0.5	10.1	6.0
April	T	1.0	1.0
May	T	T	T
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	T	T	T
November	0.1	2.8	2.8
December	0.8	9.1	8.9
Annual	4.4		

* "Local Climatological Data with Comparative Data," 1972, Chattanooga Tennessee, U.S. Department of Commerce, NOAA, EDS.

Table 1.2-5

HEAVY FOG*

CHATTANOOGA, TENNESSEE

1931-72

Month		Mean No. of Days With Heavy Fog**
December		4
January		3
February		2
	Winter	9
March		2
April		2
May		2
	Spring	6
June		2
July		2
August		3
	Summer	7
September		4
October		6
November		4
	Fall	14
	Annual	36

* "Local Climatological Data with Comparative Data," 1972, Chattanooga, Tennessee, U.S. Department of Commerce

** Heavy Fog is defined as fog reducing the visibility to ¼ mile or less.

Table 1.2-6

WIND DIRECTION PERSISTENCE DATA

Sequoyah Nuclear Plant

April 2, 1971-March 31, 1972

Direction	Number of Occurrences - Wind Direction Persistence Periods (Hours)																								
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	>25
N	39	21	9	5	3	3	2				1														
NNE	89	37	27	17	12	4	7	3	7	3	1	1		1			1		1						
NE	77	33	26	11	11	9	7	5	4	2	2	3	1		3		1								
ENE	12	7	4	1																					
E	9																								
ESE	1	1																							
SE	6	3																							
SSE	10	2	1																						
S	44	16	10	5		1	1	3		1															
SSW	73	44	27	20	15	11	5		4	3	2	4					1		1						1
SW	74	48	38	28	17	15	9	4	5	3	1	1	2	1	1	1		1							
WSW	27	14	9	3	3	5																			
W	7	5	6	1					1	1															
WNW	19	8	2	3		1																			
NW	21	14	4	6	2	1				1							1								
NNW	57	23	19	16	2	7	3	3	1	1			1	1	1	1				1					
Total	565	276	182	116	65	57	34	18	23	15	7	9	4	3	6	2	4	1	2	1					1
$\bar{>}$ Acc. Total	1391	826	550	368	252	187	130	96	78	55	40	33	24	20	17	11	9	5	4	2	1	1	1		1
$\bar{>}$ Acc. Freq.(%)	100	59.4	39.6	26.5	18.1	13.5	9.4	6.9	5.6	3.9	2.9	2.4	1.7	1.4	1.2	.8	.6	.4	.3	.1	.1	.1	.1		.1

Note: Persistent wind is defined in this analysis as a wind blowing continuously from one of the named 22-1/2° sectors (i.e., north-northwest) except that it is not considered to be interrupted if it departs from that sector for one hour and then returns, or if there are up to two hours of missing data followed by a continued dirrectional persistence.

Table 1.2-7

AVERAGE WIND SPEED DATA*

CHATTANOOGA 1951-60

Average Wind Speeds (mph)

Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Avg.	% Calm
Dec.	8.6	8.2	6.7	4.8	4.1	4.1	4.3	7.4	8.4	8.2	7.2	8.0	9.1	10.6	9.6	10.8	6.4	22.0
Jan.	9.9	8.7	7.0	5.3	4.1	3.3	4.0	7.2	8.8	8.7	7.9	9.3	8.7	10.7	10.8	11.1	7.4	17.0
Feb.	8.7	8.0	7.3	5.4	4.6	4.4	5.0	8.6	9.7	9.2	8.3	9.7	9.8	10.5	10.4	10.7	7.5	16.1
Winter	9.1	8.3	7.0	5.2	4.3	3.9	4.4	7.7	9.0	8.7	7.8	9.0	9.2	10.6	10.3	10.9	7.1	18.4
March	8.5	8.0	7.2	6.2	4.2	5.2	5.3	8.6	9.4	9.6	9.0	10.5	11.6	11.3	10.8	10.9	8.0	13.2
April	8.7	8.7	7.1	5.9	4.8	5.5	6.7	10.5	10.0	10.0	8.9	11.5	10.3	11.9	10.8	9.8	7.8	17.8
May	7.4	8.0	6.4	6.2	4.1	5.3	5.4	7.7	8.0	7.5	7.1	9.1	9.4	10.1	8.5	8.8	5.9	24.4
Spring	8.2	8.2	6.9	6.1	4.4	5.3	5.8	8.9	9.1	9.0	8.3	10.4	10.4	11.1	10.0	9.8	7.2	18.5
June	6.6	6.7	6.0	5.4	4.7	5.3	5.0	6.3	7.3	7.3	6.6	8.4	8.0	8.4	8.4	7.2	5.2	24.5
July	6.4	7.0	6.0	5.3	4.9	4.6	5.0	6.2	6.6	6.6	6.4	8.1	7.2	7.5	7.1	7.1	4.9	23.8
Aug.	6.2	6.8	6.2	5.4	4.5	4.5	4.7	5.7	6.0	6.3	5.4	6.8	6.9	7.0	6.6	6.8	4.3	30.6
Summer	6.4	6.8	6.1	5.4	4.7	4.8	4.9	6.1	6.6	6.7	6.1	7.8	7.4	7.6	7.4	7.0	4.8	26.3
Sept.	6.8	7.6	6.9	5.4	4.4	4.7	5.0	7.3	7.0	6.6	5.2	7.4	6.2	6.5	5.9	7.3	4.7	30.1
Oct.	7.9	8.0	7.5	6.2	4.4	4.3	5.6	7.2	7.0	6.2	5.4	7.5	7.0	7.8	7.7	8.8	4.8	33.1
Nov.	8.7	8.5	6.8	5.7	3.9	3.6	4.8	8.3	9.0	8.2	6.6	7.9	8.2	9.9	9.3	10.4	6.1	27.2
Fall	7.8	8.0	7.1	5.8	4.2	4.2	5.1	7.6	7.7	7.0	5.7	7.6	7.1	8.1	7.6	8.8	5.2	30.1
Annual	8.1	7.9	6.8	5.6	4.5	4.7	5.1	7.5	8.2	8.1	7.2	8.8	8.7	9.8	9.3	9.6	6.1	23.4

*Climatography of the United States No. 82-40, Decennial Census of United States Climate - Summary of Hourly Observations, Chattanooga, Tennessee, Lovell Field, 1951-1960, U.S. Department of Commerce, Weather Bureau.

Table 1.2-8

AVERAGE WIND SPEED DATA*

KNOXVILLE 1951-60

Average Wind Speeds (mph)

Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Avg.	% Calm
Dec.	7.8	8.1	6.5	6.2	4.1	4.2	4.1	4.8	6.5	8.4	11.3	12.1	10.8	11.6	8.4	7.7	7.8	9.0
Jan.	8.5	9.2	7.2	7.0	4.7	4.8	4.4	4.7	6.8	10.1	12.8	11.9	11.5	11.6	9.0	8.2	8.7	7.6
Feb.	7.5	8.9	7.0	7.0	4.8	4.7	4.6	5.3	7.5	10.1	12.6	12.5	11.4	13.0	9.3	7.6	7.6	8.2
Winter	7.9	8.7	6.9	6.7	4.5	4.6	4.4	4.9	6.9	9.5	12.2	12.2	11.2	12.1	8.9	7.8	8.4	8.3
March	8.2	9.2	7.7	7.4	5.3	5.1	4.9	6.8	6.5	9.3	12.9	13.4	12.0	13.1	10.5	9.3	9.5	6.0
April	8.4	9.6	7.6	7.0	5.1	5.9	5.5	7.9	8.3	10.7	12.8	13.9	12.2	12.6	9.9	8.6	9.6	7.3
May	8.0	8.0	7.0	7.3	5.0	5.8	5.0	6.1	6.1	8.0	10.3	10.7	9.7	10.0	8.3	8.1	7.7	10.0
Spring	8.2	8.9	7.4	7.2	5.1	5.6	5.1	6.9	7.0	9.3	12.0	12.7	11.3	11.9	9.6	8.7	8.9	7.8
June	7.6	7.6	6.6	6.3	5.5	5.4	5.1	5.3	5.6	7.9	9.3	9.2	9.0	8.4	7.7	7.2	6.9	10.4
July	7.0	7.6	6.4	6.3	4.8	5.0	5.0	4.7	5.7	7.6	8.8	9.0	7.7	8.1	7.2	6.1	6.3	12.8
Aug.	7.1	7.5	5.9	5.9	4.8	4.5	4.7	4.7	4.9	7.4	7.8	8.5	8.3	8.2	7.3	6.8	5.8	15.1
Summer	7.2	7.6	6.3	6.2	5.0	5.0	4.9	4.9	5.4	7.6	8.6	8.9	8.3	8.2	7.4	6.7	6.3	12.8
Sept.	6.9	7.4	6.4	6.9	5.0	4.8	4.6	4.9	5.7	7.0	7.6	8.9	7.5	7.2	6.5	7.1	5.7	15.4
Oct.	7.5	8.0	6.9	6.3	4.1	4.1	4.1	4.1	5.0	7.3	8.2	8.7	8.9	8.8	8.0	7.4	6.0	14.8
Nov.	7.9	7.9	6.4	5.8	4.3	4.5	4.1	4.8	6.6	8.3	10.5	10.4	10.1	11.3	8.7	7.1	7.1	11.3
Fall	7.4	7.8	6.6	6.3	4.5	4.5	4.3	4.6	5.8	7.5	8.8	9.3	8.8	9.1	7.7	7.2	6.3	13.3
Annual	7.7	8.3	6.8	6.6	4.8	4.9	4.7	5.3	6.2	8.5	10.6	11.1	10.1	10.8	8.4	7.6	7.5	10.7

*Climatography of the United States No. 82-40, Decennial Census of United States Climate - Summary of Hourly Observations, Knoxville, Tennessee, McGhee Tyson Airport, 1951-60, U.S. Department of Commerce, Weather Bureau.

Table 1.2-9

PERCENT OCCURRENCE OF WIND SPEED*

FOR ALL WIND DIRECTIONS

Sequoyah Nuclear Plant

Annual

April 2, 1971-March 31, 1972

Wind Direction	Wind Speed (mph) .6-3.4	3.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>24.5	Total
N	3.68	2.01	0.29				5.99
NNE	7.78	4.68	0.51			0.01	12.98
NE	8.47	4.23	0.34	0.03			13.07
ENE	1.92	0.37					2.29
E	0.92	0.04					0.96
ESE	0.50	0.06					0.57
SE	1.03	0.19	0.01				1.24
SSE	1.39	0.34	0.03				1.76
S	3.20	2.19	0.51	0.06			5.96
SSW	5.01	6.88	1.94	0.14			13.96
SW	5.01	9.40	2.18	0.13			16.71
WSW	2.24	2.00	0.45				4.69
W	1.03	0.80	0.27	0.01			2.11
WNW	1.03	0.89	0.52	0.01			2.46
NW	1.29	1.16	0.96	0.06			3.46
NNW	4.31	2.94	1.25	0.10			8.60
Total	48.82	38.19	9.25	0.55		0.01	96.82

Calm = 3.18

Lost Record = 10.39

*Wind Instrument 33 feet above ground.
Note: Total of all columns and calm (good observations) is 100 percent.

Table 1.2-10

DURATIONS OF ZERO-FLOW PERIODS

AT WATTS BAR AND CHICKAMAUGA DAM FOR

THE PERIOD 1959-1968

Duration (hours)	No. of Occurrences	
	Watts Bar	Chickamauga
1	140	25
2	212	29
3	299	62
4	317	75
5	320	69
6	266	67
7	170	42
8	99	24
9	45	11
10 or greater	32	10

Table 1.2-11

TENNESSEE RIVER MILE 472.3

Date	Time	Location in Stream	Depth	Total Coliforms	Temp.	D.O.	5-Day 20°C. BOD	Color	Turb.	Thresh-old Odor	Alkalinity Phen.	Alkalinity Tot.	Hard. $CaCO_3$	pH	Spec. Resist-ance	Cl	Ca	Mg	Na	K	Fe, Total	Nitrite + Nitrate Nitrogen	SiO_2	SO_4	Solids Sus.	Solids Dis.	Solids Tot.
1960			ft.	MPN/100 ml	°C.	mg/l	mg/l	PCU	JCU	No.	mg/l	mg/l	mg/l		ohms	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
7-12	10:00 a.	Middle	Surf.	11	28.0	7.70	1.90	5	6.0	None	0.00	48.4	75.2	8.2	4,800	13.4	23.4	8.60	7.40	0.80	0.19	0.00	0.80	17.6	21	83	104
			10		27.2	7.40								8.1													
			20		26.2	6.49								7.9													
			30		25.4	5.15								7.6													
			40		24.4	4.40								7.6													
			50		24.2	4.00								7.5													
			55		24.3	3.92								7.4													
8-5	10:03 a.	Middle	Surf.	5.2	28.8	7.96	1.37	10	5.2	-	0.00	53.0	74.4	8.2	5,300	12.7	22.6	5.09	6.90	0.80	0.10	0.00	3.56	18.2	4	114	118
			10		28.4	7.78								8.1													
			20		26.9	5.40								7.8													
			30		25.6	3.81								7.4													
			40		25.3	3.61	1.39	10	9.4	-	0.00	53.9	78.3	7.4	5,000	12.9	22.8	6.10	7.10	0.85	0.28	0.18	3.88	18.2	28	96	124
			50		24.9	3.57								7.4													
			54		24.9	3.50								7.9													
8-23	5:00 p.	Middle	Surf.	2.6	29.1	8.11	1.74	10	3.8	-	0.00	51.2	75.0	8.3	5,400	9.93	22.1	5.66	6.60	0.85	0.03	0.00	3.70	17.3	4	92	96
			5		27.2	8.06								8.1													
			10		25.8	6.63								7.9													
			20		25.7	5.65								7.7													
			30		25.3	5.32								7.6													
			40		25.1	4.83	0.77	10	21	-	0.00	50.5	74.6	7.6	5,400	10.2	23.0	4.84	6.10	0.85	0.07	0.42	3.90	18.2	6	112	118
			50		25.0	4.73								7.6													
			55		24.7	4.64								7.7													
9-22	9:50 a.	Middle	Surf.	110	24.8	6.63	1.33	10	6.3	-	0.00	47.2	75.0	7.6	4,800	18.9	22.3	5.54	8.90	0.90	0.24	0.08	5.92	15.5	12	128	140
			5		24.3	6.63								7.6													
			10		24.2	6.31								7.6													
			20		24.1	6.31								7.6													
			30		24.2	6.33	1.38	10	11	-	0.00	47.0	72.2	7.6	4,900	18.8	22.0	4.91	9.40	1.00	0.33	0.22	6.64	15.5	38	109	147
			40		24.1	6.33								7.6													
			50		24.1	6.14								7.6													
			55		24.0	6.17								7.6													
10-18	4:05 p.	Middle	Surf.	160*	23.6	8.08	1.84	10	6.3	1+	0.00	50.3	74.4	7.9	4,500	21.6	22.1	5.47	9.50	1.00	0.16	0.48	6.12	15.5	21	67	88
			5		23.1	7.97								7.9													
			10		22.7	7.24								7.8													
			20		22.4	6.67								7.8													
			30		22.4	6.66	0.99	10	9.8	2	0.00	49.2	73.5	7.7	4,700	19.3	22.1	5.22	9.50	1.00	0.28	0.08	7.20	15.5	5	96	101
			40		22.4	6.72								7.7													
			50		22.4	6.67								7.7													
11-22	3:12 p.	Middle	Surf.	280	13.9	9.23	1.64	15	6.7	None	0.00	46.4	70.2	7.6	4,800	19.0	18.9	6.54	10.0	0.95	0.32	0.10	6.12	18.2	27	70	97
			5		13.1	8.84								7.5													
			10		12.8	8.71								7.5													
			20		12.8	9.31								7.6													
			30		12.8	8.65	1.50	15	8.6	1+	0.00	47.0	70.2	7.5	4,700	20.1	19.0	6.48	11.0	1.00	0.44	0.15	6.80	15.5	16	92	108
			42		12.8	8.60								7.5													
12-13	3:55 p.	Middle	Surf.	6,200	8.9	10.28	2.94	15	11	2	0.00	48.0	70.0	7.6	5,000	18.6	21.1	4.91	9.80	1.00	0.39	0.10	7.04	19.1	4	91	95
			10		8.9	10.30								-													
			20		8.9	10.20								-													
			30		8.9	10.18								-													
			40		8.9	10.26								-													
			50		8.9	10.20	1.46	15	14	2	0.00	48.5	70.0	7.6	5,000	18.1	21.7	4.53	9.80	1.00	0.42	0.10	7.54	18.2	37	100	137

*Collected on Oct. 25, 1960.

Table 1.2-11 (continued)

TENNESSEE RIVER MILE 472.3

Date	Time	Location in Stream	Depth	Total Coliforms	Temp.	D.O.	5-Day 20°C. BOD	Color	Turb.	Thresh-old Odor	Alkalinity Phen.	Alkalinity Tot.	Hard. $CaCO_3$	pH	Spec. Resist-ance	Cl	Ca	Mg	Na	K	Fe, Total	Nitrite + Nitrate Nitrogen	SiO_2	SO_4	Solids Sus.	Solids Dis.	Solids Tot.
1961			ft.	MPN/100 ml	°C.	mg/l	mg/l	PCU	JCU	No.	mg/l	mg/l	mg/l		ohms	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
1-19	3:05 p.	Middle	Surf.	70,000	6.0	11.35	1.34	15	9.4	1+	0.00	46.0	64.0	7.3	5,600	13.6	18.8	4.72	7.50	0.85	0.29	0.22	7.00	18.2	19	75	94
			5		6.0	11.36								-													
			10		6.0	11.35								-													
			20		6.0	11.38								-													
			30		6.0	11.35	1.36	15	11	1+	0.00	45.0	62.9	-	5,600	13.6	19.2	4.09	6.90	0.85	0.27	0.32	6.64	16.4	14	75	89
			40		6.0	11.54								-													
			48		6.0	11.42								7.3													
2-21	3:40 p.	Middle	Surf.	220	8.3	12.14	1.73	20	14	None	0.00	55.4	76.2	7.5	4,800	15.2	22.6	5.41	7.90	0.90	0.19	0.22	6.48	20.9	16	107	123
			5		8.3	12.12								-													
			10		8.3	11.98								-													
			20		8.3	12.12								-													
			30		8.3	11.99	1.38	15	14	2	0.00	56.0	76.2	7.5	4,800	15.4	22.7	5.35	7.50	0.85	0.25	0.28	6.28	20.9	33	93	126
			40		8.3	11.02								-													
			50		8.3	12.05								-													
3-21	4:30 p.	Middle	Surf.	1,300	11.3	9.68	1.12	10	30	None	0.00	45.8	58.7	8.1	6,600	5.84	17.6	2.86	3.50	1.00	1.88	0.28	7.90	30.4	11	103	114
			10		11.3	9.62								8.1													
			20		11.3	9.54								8.1													
			30		11.3	9.54	1.58	15	29	1+	0.00	46.5	59.2	8.0	6,600	5.84	17.1	3.32	3.00	0.95	1.58	0.22	8.40	30.4	11	109	120
			40		11.3	9.61								8.0													
			50		11.3	9.59								7.9													
4-18	5:15 p.	Middle	Surf.	36	14.0	10.17	1.44	15	21	None	0.00	40.8	58.1	8.0	7,200	7.42	14.9	4.31	4.30	0.85	0.64	0.18	5.92	13.6	6	80	86
			5		14.0	10.21								8.0													
			10		14.0	10.07								8.0													
			20		14.0	10.07								7.9													
			30		14.0	10.01								7.9													
			40		14.0	9.93	1.36	15	23	None	0.00	41.4	58.3	7.9	7,100	7.56	15.2	4.43	4.50	0.80	0.77	0.18	6.02	13.6	4	72	76
			50		14.0	10.00								7.8													
			60		13.3	10.00								7.8													
5-16	5:00 p.	Middle	Surf.	6.0	21.0	9.08	1.14	10	5.0	1+	0.00	44.9	55.6	7.9	7,700	4.30	16.9	4.03	4.64	0.95	0.08	0.00	5.20	11.8	26	66	92
			5		20.8	9.10								-													
			10		20.6	9.03								-													
			20		19.6	8.80								-													
			30		18.6	8.31								-													
			40		17.8	8.57	1.53	15	17	1+	0.00	46.0	54.1	7.7	7,300	4.50	17.8	2.96	4.20	0.80	0.12	0.10	6.44	27.9	6	85	91
			55		17.4	8.27								-													
6-14	5:20 p.	Middle	Surf.	2.6	26.2	8.40	1.40	15	5.0	None	0.00	48.9	63.6	8.8	7,200	6.99	19.4	5.85	4.55	0.95	0.01	0.10	4.74	12.8	29	90	119
			5		26.2	8.42								8.8													
			10		25.7	8.33								8.6													
			20		23.7	7.82								8.5													
			30		22.6	6.17	0.86	15	11	None	0.00	48.8	63.6	8.0	6,900	7.09	18.2	5.41	4.35	0.90	0.15	0.15	5.40	12.8	16	71	87
			40		22.1	5.26								7.9													
			50		21.9	4.97								7.8													
Maximum Values				70,000	29.1	12.14	2.94	20	30	2	0.00	56.0	78.3	8.8	7,700	21.6	23.4	8.60	11.0	1.00	1.88	0.48	8.40	30.4	38	128	147
Minimum Values				2.6	6.0	3.50	0.77	5	3.8	None	0.00	40.8	54.1	7.3	4,500	4.30	14.9	2.86	3.00	0.80	0.01	0.00	0.80	11.8	4	66	76

Table 1.2-12

OBSERVED TRACE METAL CONCENTRATIONS (TOTAL) IN VICINITY OF WATER INTAKE

SEQUOYAH NUCLEAR PLANT

Tennessee River Mile 484.1

All results expressed as micrograms per liter (ug/l)

Date of Sample	Depth ft.	Iron	Manganese	Copper	Zinc	Chromium*	Nickel	Aluminum	Silver	Lead	Mercury	Barium	Arsenic	Cadmium	Selenium	Berylium
5/3/71	3	310		<10	20	<50	<50									
8/2/71	3	300		<10	70	<50	<50									
11/8/71	3	370	90.0	<10	30	<50	<50									
2/1/72	3	510		<10	50	12	<50									
5/2/72	3	280	50.0	10	50	<10	<50									
8/1/72	3	310	60.0	<10	20	<5	<50									
11/8/72	3	590	80.0	<10	20	<5	<50									
2/28/73	3	690	60.0	<10	60	<5	<50	700	<10	<10	0.2	<100	<5	<1	1	<10
	39	710	70.0	<10	150	<5	<50	1,200	<10	<10	0.4	<100	<5	<1	1	<10
5/21/73	3	450	60.0	20	80	<5	<50	1,000	<10	<10	<0.2	<100	<5	<1	<1	<10
	39	620	80.0	10	80	<5	<50	1,200	<10	<10	<0.2	<100	<5	<1	<1	<10

*Precision of analysis was improved during the sampling period.

Table 1.2-13

OBSERVED MONTHLY MAXIMUM AND MINIMUM TEMPERATURES

CHICKAMAUGA RESERVOIR - TENNESSEE RIVER MILE 485.7

Temperature at Elev. 677 (Depth at Summer Pool: ∿6 ft.), °F

1969-1972

Month	1969		1970		1971		1972	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan	-	-	45.0	39.0	47.0	41.5	53.0	46.0
Feb	46.0	46.0	45.5	40.0	48.5	40.0	48.5	43.5
Mar	-	-	54.5	45.5	52.5	46.5	54.0	47.5
Apr	66.0	61.0	64.0	53.0	68.0	51.5	63.5	52.5
May	75.0	64.0	72.5	63.0	71.5	59.5	72.0	61.5
Jun	83.5	72.5	74.5	71.0	78.5	67.0	79.5	66.5
Jul	88.0	62.0	81.0	74.5	82.0	73.0	81.5	70.0
Aug	84.0	78.5	81.0	75.0	79.5	71.5	84.5	72.5
Sep	80.0	76.0	80.5	75.0	80.0	72.5	79.0	74.0
Oct	74.0	64.0	76.5	67.0	76.0	57.5	73.0	61.0
Nov	64.0	56.0	67.5	38.0	69.5	54.0	62.0	50.0
Dec	-	-	56.0	46.5	55.0	50.0	52.0	47.0

Table 1.2-14

PUBLIC WATER SUPPLIES WITHIN 20-MILE RADIUS OF PLANT SITE AND THOSE TAKEN FROM TENNESSEE RIVER BETWEEN WATTS BAR AND NICKAJACK DAMS*

	Water Supply	Distance From Site**	Estimated Population Served	Average Daily Use	Source
		miles		gallons	
1.	Charleston-Calhoun Utility District	19.8	1,530	84,000	Ground, wells
2.	Chattanooga***	19.2	290,000	54,840,000	Surface (TRM 465.3)
3.	Cleveland	19.2	35,000	7,500,000	Surface (HRM 22.9) and spring
4.	Daisy-Soddy-Falling Water Utility Dist.	8.2	8,000	400,000	Surface (Little Soddy Creek mile 0.5)
5.	Dayton	15.8	6,000	1,000,000	Surface (TRM 503.8)
6.	Dunlap	18.2	2,550	320,000	Surface (Sequatchie River)
7.	East Side Utility District****	7.0	30,800	3,121,000	Ground, wells****
8.	Graysville	16.5	1,450	85,000	Ground, wells
9.	Hixson Utility Dist.	8.5	28,300	2,400,000	Ground, spring
10.	Mowbray Mountain Utility Dist.	8.0	730	20,400	Surface (Montlake)
11.	Pine Hills Subdivision	10.5	32	3,200	Ground, wells
12.	Sale Creek Utility Dist.	10.0	730	47,000	Ground, wells
13.	Savannah Valley Utility Dist.	0.9	2,000	122,000	Surface (TRM 483.6)*****
14.	Union Fork-Bakewell Utility Dist.	8.5	1,070	40,000	Ground, wells
15.	Walden's Ridge Utility Dist.	13.0	3,040	210,000	Ground, wells

*Source of data: 1972 Water Resources Inventory, Tennessee Department of Conservation

**Radial distance to all supplies except those that take water directly from the Tennessee River which are shown as river mile distance from TRM 484.5

***City Water Company of Chattanooga was renamed Tennessee-American Water Company as of September 4, 1973

****The Tennessee-American Water Company of Chattanooga purchased approximately 67 percent of the East Side Utility District effective May 1973

*****Intake will be relocated

Table 1.2-15

INDUSTRIAL WATER SUPPLIES WITHIN 20-MILE RADIUS OF PLANT SITE

AND THOSE TAKEN FROM TENNESSEE RIVER BETWEEN WATTS BAR AND NICKAJACK DAMS*

Water Supply	Distance From Site**	Number of Employees	Average Daily Use	Source
	Miles		Gallons	
Calhoun (Bowaters Southern Paper Corporation)	19.5	1,300	74,000,000***	Surface (HRM 22.7)
Charleston (Olin Mathieson Chemical Company)	19.4	217	7,200,000***	Surface (HRM 22.3)
Chattanooga (Alco Chemical Corporation)	13.2	22	75,000	Ground, well
Chattanooga (American Cyanamid Company)	18.5	18	50,000***	Ground, wells
Chattanooga (Atlas Chemical Industries, Inc.)	11.5****	2,000	50,000,000***	Surface (TRM 473.0)
Chattanooga (Chattanooga Rendering Company)	19.8		7,000	Ground, wells
Chattanooga (Chattem Chemicals)	20.0	244	714,000	Ground, wells
Chattanooga (Combustion Engineering Company)	19.0	5,200	120,000	Ground, well
Chattanooga (Container Corporation of America)	18.2	130	840,000	Ground, well
Chattanooga (Cumberland Corporation)	17.0	400	68,000	Ground, well
Chattanooga (Cutter Laboratories)	16.0	700	46,000	Ground, well
Chattanooga (Dave L. Brown Company)	19.5	75	12,000	Ground, well
Chattanooga (Desoto, Inc.)	15.0	300	72,000	Ground, well
Chattanooga (Dixie Sand and Gravel Company)	21.5***	45	480,000	Surface (TRM 463.0)
Chattanooga (Dixie Yarns, Inc.)	13.0	680	83,500***	Ground, wells

Table 1.2-15 (Continued)

Water Supply	Distance From Site**	Number of Employees	Average Daily Use	Source
	Miles		Gallons	
Chattanooga (E. I. du Pont and Company)	14.0****	3,700	7,200,000***	Surface (TRM 470.5)
Chattanooga (Farmers Chemical Association)	11.5****	230	2,000,000***	Surface (TRM 473.0)
Chattanooga (General Portland Cement Co.)	30.3****	146	2,000,000	Surface (TRM 454.2)
	53.4****		200,000	Surface (TRM 431.1)
Chattanooga (Hamilton Concrete Products, Inc.)	2010	75	2,500	Ground, spring
Chattanooga (Kay's Ice Cream, Inc.)	17.0	17	35,000	Ground, well
Chattanooga (Olin Conductors)	18.2	350	112,500	Ground, well
Chattanooga (Scholze Tannery)	19.5	185	297,000	Ground, wells
Chattanooga (Selox, Inc.)	11.5	10	25,000***	Ground, well
Chattanooga (Sherman Reilly, Inc.)	17.6	35	7,000	Ground, well
Chattanooga (Southern Machine Company)	19.0	125	11,700	Ground, well
Chattanooga (Stainless Metal Products, Inc.)	13.0	75	10,000**	Ground, well
Chattanooga (Tennessee Paper Mills)	18.0****	215	289,000	Ground, well
	21.0		249,000	Surface (TRM 463.5)
Chattanooga (Vulcan Materials Company)	16.0	37	10,000	Ground, wells
	18.0	3	115,000	Surface (Dollar Pond)
Cleveland (Bradley Limestone Company, Inc.)	19.0	42	180,000	Ground, well

Table 1.2-15 (Continued)

	Water Supply	Distance From Site**	Number of Employees	Average Daily Use	Source
		Miles		Gallons	
30.	Cleveland (Cleveland-Tennessee (Enamel Co.)	13.0	340	61,600	Ground, wells
31.	Cleveland (Magic Chef, Inc.)	13.0	1,400	210,000	Ground, spring
32.	Dayton (Zenith Hosiery Mill)	19.5	75	30	Ground, well
33.	Sale Creek (Modulon Carpets)	13.5	60	500***	Ground, well

*Source of data: 1970 Water Resources Inventory, Tennessee Department of Conservation and TVA Division of Environmental Planning files

**Radial distance to all supplies except those that take water directly from the Tennessee River which are shown as river mile distance from TRM 484.5

***Water supply is also used for potable water within the plant

****Distance shown is by river miles

TABLE 1.2-16

1970 POPULATION DISTRIBUTION WITHIN TEN MILES OF SITE

	Total Population	Miles from Site 0-1	1-2	2-3	3-4	4-5	5-10
N	890	-	15	50	10	5	810
NNE	545	-	-	60	85	45	355
NE	390	-	-	-	45	30	315
ENE	650	-	15	-	100	130	405
E	540	-	25	20	85	70	340
ESE	1,225	10	65	65	135	80	870
SE	965	5	190	25	85	85	575
SSE	1,275	-	35	115	335	105	685
S	1,570	-	80	5	190	265	1,030
SSW	3,425	-	55	55	205	115	2,995
SW	2,535	-	-	45	175	45	2,270
WSW	6,475	5	65	335	650	615	4,805
W	3,430	5	35	115	275	200	2,800
WNW	3,030	-	25	145	405	285	2,170
NW	3,965	10	40	185	210	200	3,320
NNW	1,235	10	80	15	40	145	945
Total	32,145	45	725	1,235	3,030	2,420	24,690

Table 1.2-17

1970 POPULATION DISTRIBUTION WITHIN FIFTY MILES OF SITE

	Total Population	Miles from Site 0-10	10-20	20-30	30-40	40-50
N	14,550	890	3,425	1,860	2,570	5,805
NNE	19,970	545	6,055	3,915	4,685	4,770
NE	22,025	390	1,210	2,830	7,600	9,995
ENE	41,510	650	3,770	5,425	21,405	10,260
E	19,690	540	9,995	3,285	1,835	4,035
ESE	43,600	1,225	26,685	3,250	1,055	11,385
SE	13,265	965	4,960	3,135	1,845	2,360
SSE	48,495	1,275	6,075	8,590	29,210	3,345
S	47,810	1,570	9,840	9,785	19,000	7,615
SSW	137,590	3,425	79,150	34,630	13,825	6,560
SW	146,185	2,535	104,960	25,950	7,495	5,245
WSW	48,275	6,475	19,655	4,455	9,345	8,345
W	17,075	3,430	1,490	4,660	3,785	3,710
WNW	14,545	3,030	2,390	3,135	4,080	1,910
NW	14,320	3,965	980	1,365	725	7,285
NNW	10,110	1,235	540	2,780	1,545	4,010
Total	659,015	32,145	281,180	119,050	130,005	96,635

Table 1.2-18

1980 POPULATION DISTRIBUTION WITHIN TEN MILES OF SITE

	Total Population	Miles from Site 0-1	1-2	2-3	3-4	4-5	5-10
N	730	-	15	40	10	5	660
NNE	440	-	-	50	65	40	285
NE	315	-	-	-	40	25	250
ENE	555	-	15	-	80	105	355
E	505	-	20	15	70	55	345
ESE	1,195	10	50	50	110	65	910
SE	900	5	155	20	70	70	580
SSE	1,045	-	25	95	270	85	570
S	1,275	-	65	5	155	215	835
SSW	2,785	-	45	45	170	95	2,430
SW	2,860	-	-	40	140	35	2,645
WSW	6,785	5	50	270	530	500	5,430
W	3,845	5	30	95	220	180	3,315
WNW	3,385	-	20	120	325	375	2,545
NW	4,930	10	35	150	165	220	4,350
NNW	1,160	10	60	10	35	160	885
Total	32,710	45	585	1,005	2,455	2,230	26,390

Table 1.2-19

1990 POPULATION DISTRIBUTION WITHIN TEN MILES OF SITE

	Total Population	Miles from Site 0-1	1-2	2-3	3-4	4-5	5-10
N	715	-	15	40	10	5	645
NNE	430	-	-	50	65	35	280
NE	305	-	-	-	35	25	245
ENE	545	-	15	-	75	105	350
E	500	-	20	15	65	55	345
ESE	1,190	5	50	50	110	65	910
SE	890	5	150	20	65	65	585
SSE	1,020	-	25	90	265	85	555
S	1,245	-	65	5	150	210	815
SSW	2,720	-	45	40	165	95	2,375
SW	3,230	-	-	35	140	35	3,020
WSW	7,380	5	50	265	515	490	6,055
W	4,810	5	30	90	215	190	4,280
WNW	4,225	-	20	115	320	510	3,260
NW	6,520	10	30	145	165	280	5,890
NNW	1,300	10	65	10	30	195	990
Total	37,025	40	580	970	2,390	2,445	30,600

Table 1.2-20

2000 POPULATION DISTRIBUTION WITHIN TEN MILES OF SITE

	Total Population	Miles from Site 0-1	1-2	2-3	3-4	4-5	5-10
N	700	-	10	40	10	5	635
NNE	420	-	-	45	65	35	275
NE	300	-	-	-	35	25	240
ENE	530	-	15	-	75	100	340
E	490	-	20	15	65	55	335
ESE	1,165	5	50	50	105	65	890
SE	875	5	150	20	65	65	570
SSE	1,000	-	25	90	260	80	545
S	1,220	-	60	5	150	205	800
SSW	2,655	-	45	40	160	90	2,320
SW	3,600	-	-	35	135	35	3,395
WSW	7,975	5	50	260	505	475	6,680
W	5,770	5	30	90	210	200	5,235
WNW	5,065	-	20	115	310	645	3,975
NW	8,100	5	30	145	160	335	7,425
NNW	1,435	10	60	10	30	235	1,090
Total	41,300	35	565	960	2,340	2,650	34,750

Table 1.2-21

2010 POPULATION DISTRIBUTION WITHIN TEN MILES OF SITE

	Total Population	Miles from Site 0-1	1-2	2-3	3-4	4-5	5-10
N	680	-	15	35	10	5	615
NNE	410	-	-	45	65	35	265
NE	290	-	-	-	35	20	235
ENE	520	-	10	-	75	100	335
E	475	-	20	15	60	50	330
ESE	1,140	5	50	50	100	60	875
SE	855	5	145	15	65	65	560
SSE	975	-	25	85	255	80	530
S	1,185	-	60	5	145	200	775
SSW	2,585	-	45	40	155	85	2,260
SW	3,970	-	-	35	130	35	3,770
WSW	8,565	5	50	250	490	465	7,305
W	6,785	5	30	85	205	215	6,245
WNW	5,955	-	20	110	305	790	4,730
NW	9,775	5	30	140	160	390	9,050
NNW	1,575	5	60	10	30	270	1,200
Total	45,740	30	560	920	2,285	2,865	39,080

Table 1.2-22

1980 POPULATION DISTRIBUTION WITHIN FIFTY MILES OF SITE

	Total Population	Miles from Site 0-10	10-20	20-30	30-40	40-50
N	15,605	730	3,560	2,030	2,535	6,750
NNE	20,805	440	6,485	4,120	4,705	5,055
NE	23,270	315	1,230	2,860	7,615	11,250
ENE	46,035	555	3,900	6,200	24,740	10,640
E	21,920	505	11,930	3,380	2,005	4,100
ESE	51,760	1,195	34,815	3,350	1,075	11,325
SE	15,040	900	6,835	3,140	1,795	2,370
SSE	56,420	1,045	6,840	9,005	36,080	3,450
S	51,060	1,275	9,565	9,895	22,290	8,035
SSW	156,825	2,785	90,575	42,330	14,695	6,440
SW	162,260	2,860	115,955	29,725	8,655	5,065
WSW	54,975	6,785	23,310	4,595	11,440	8,845
W	17,480	3,845	1,470	4,820	3,705	3,640
WNW	14,875	3,385	2,645	3,160	3,835	1,850
NW	17,880	4,930	1,050	1,460	765	9,675
NNW	10,060	1,160	510	2,725	1,555	4,110
Total	736,270	32,710	320,675	132,795	147,490	102,600

Table 1.2-23

1990 POPULATION DISTRIBUTION WITHIN FIFTY MILES OF SITE

	Total Population	Miles from Site 0-10	10-20	20-30	30-40	40-50
N	17,240	715	3,985	2,255	2,535	7,750
NNE	21,905	430	7,080	4,340	4,705	5,350
NE	23,940	305	1,225	2,820	7,355	12,235
ENE	50,985	545	3,880	6,920	28,505	11,135
E	24,110	500	13,730	3,465	2,215	4,200
ESE	60,505	1,190	43,215	3,465	1,115	11,520
SE	16,855	890	8,635	3,165	1,795	2,370
SSE	66,410	1,020	8,375	9,475	44,075	3,465
S	56,905	1,245	10,985	10,070	26,395	8,210
SSW	180,385	2,720	104,720	50,790	15,695	6,460
SW	183,810	3,230	132,360	33,875	9,250	5,095
WSW	62,595	7,380	26,265	4,860	13,300	10,790
W	18,950	4,810	1,535	5,095	3,800	3,710
WNW	15,995	4,225	2,830	3,265	3,835	1,840
NW	21,995	6,520	1,110	1,530	795	12,040
NNW	10,310	1,300	505	2,725	1,580	4,200
Total	832,895	37,025	370,435	148,115	166,950	110,370

Table 1.2-24

2000 POPULATION DISTRIBUTION WITHIN FIFTY MILES OF SITE

	Total Population	Miles from Site 0-10	10-20	20-30	30-40	40-50
N	18,950	700	4,425	2,490	2,535	8,800
NNE	22,990	420	7,695	4,555	4,670	5,650
NE	24,640	300	1,225	2,780	7,120	13,215
ENE	55,930	530	3,795	7,385	32,385	11,835
E	27,045	490	15,490	3,540	3,225	4,300
ESE	69,450	1,165	51,855	3,560	1,150	11,720
SE	18,620	875	10,420	3,160	1,795	2,370
SSE	76,855	1,000	9,395	9,480	53,525	3,455
S	62,370	1,220	11,955	10,070	30,940	8,185
SSW	207,430	2,655	120,825	60,835	16,670	6,445
SW	209,255	3,600	151,815	38,860	9,845	5,135
WSW	70,950	7,975	29,745	5,120	15,270	12,840
W	20,410	5,770	1,590	5,370	3,895	3,785
WNW	17,120	5,065	3,020	3,365	3,835	1,835
NW	25,860	8,100	1,170	1,610	825	14,155
NNW	10,555	1,435	505	2,730	1,600	4,285
Total	938,430	41,300	424,925	164,910	189,285	118,010

Table 1.2-25

2010 POPULATION DISTRIBUTION WITHIN FIFTY MILES OF SITE

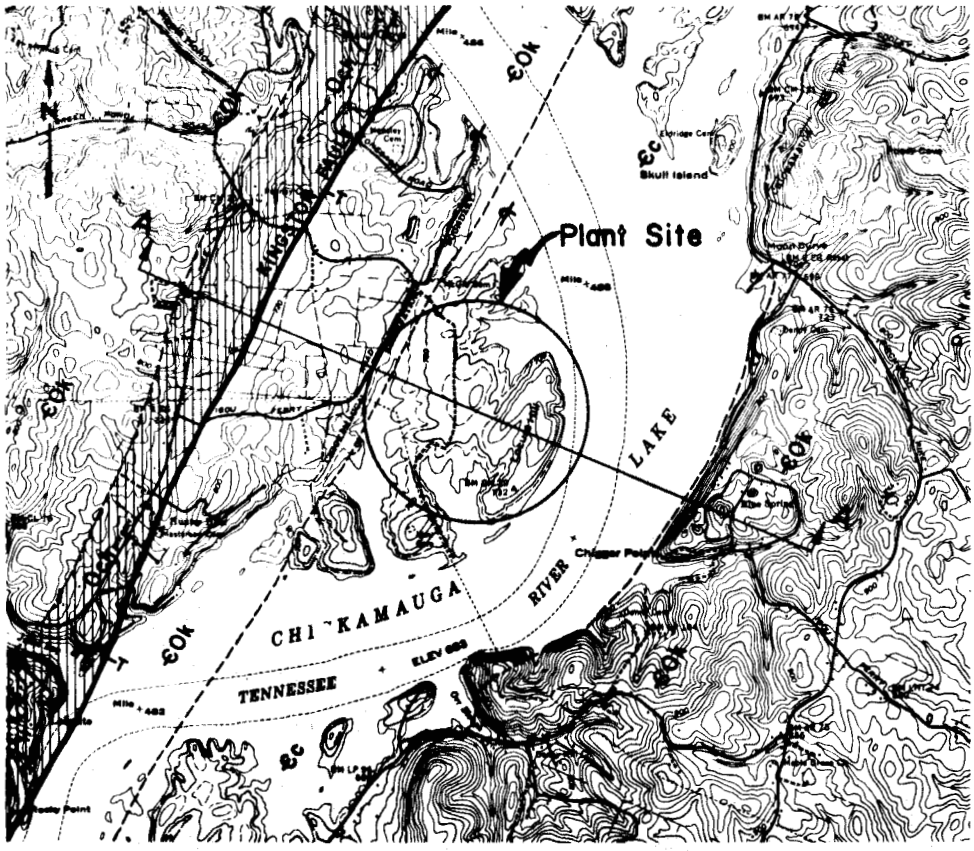
	Total Population	Miles from Site 0-10	10-20	20-30	30-40	40-50
N	20,855	680	4,865	2,725	2,535	10,050
NNE	24,405	410	8,315	4,770	4,635	6,275
NE	25,645	290	1,220	2,765	7,000	14,370
ENE	62,615	520	3,715	8,470	37,275	12,635
E	29,210	475	17,245	3,625	3,450	4,415
ESE	78,415	1,140	60,490	3,660	1,190	11,935
SE	20,390	855	12,205	3,165	1,795	2,370
SSE	89,255	975	10,085	9,950	64,775	3,470
S	69,140	1,185	12,560	10,250	36,795	8,350
SSW	238,075	2,585	139,250	72,170	17,640	6,430
SW	238,150	3,970	174,125	44,450	10,435	5,170
WSW	79,810	8,565	33,710	5,435	17,105	14,995
W	22,025	6,785	1,655	5,700	4,005	3,880
WNW	18,300	5,955	3,210	3,465	3,835	1,835
NW	29,860	9,775	1,235	1,680	870	16,300
NNW	10,860	1,575	505	2,725	1,635	4,420
Total	1,057,010	45,740	484,390	185,005	214,975	126,900

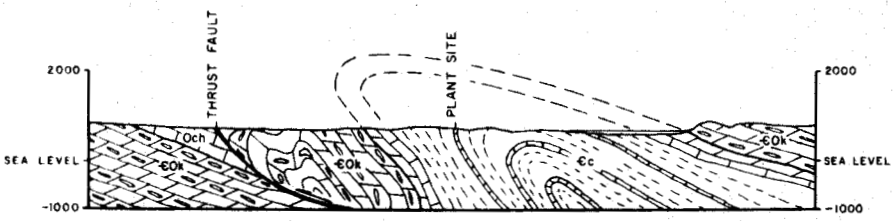
Table 1.2-26

Habitat Evaluation for Seven Game Species

(Bradley and Hamilton Counties)

Species	Habitat Rating			
	Good	Average	Poor	Nonhabitat
	- - - -percent of total land area - - - -			
White-tailed deer	15	32	32	21
Gray squirrel	9	21	36	34
Raccoon	10	19	41	30
Wild turkey	8	14	22	56
Ruffed grouse	4	20	24	52
Cottontail rabbit	11	26	38	25
Bobwhite quail	5	26	36	33





SECTION A–A

LEGEND:

Ordovician

Och — *Chickamauga Formation*

Cambro–Ordovician

€Ok — *Knox Formation*

Cambrian

€c — *Conasauga Formation*

— *Major thrust fault.*

— *Formation contact.*

NOTE:

This drawing supersedes drawing 45-GE-4-822N1776.

FIGURE 1.2-1

Scale 1:24,000

0.0 0.5 1.0 Mile

Contour Interval – 20 Feet

REV NO.	DATE	MADE	CHKD	SUPV	INSP

DRWN ..... COMPUTED
TRCD ..... ENGINEER
CHKD .....

GEOLOGIC INVESTIGATIONS

GEOLOGIC AND TECTONIC MAP OF PLANT AREA

SEQUOYAH NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING

SUBMITTED	RECOMMENDED	APPROVED

KNOXVILLE	10-28-69	45	GE	4	822G1789

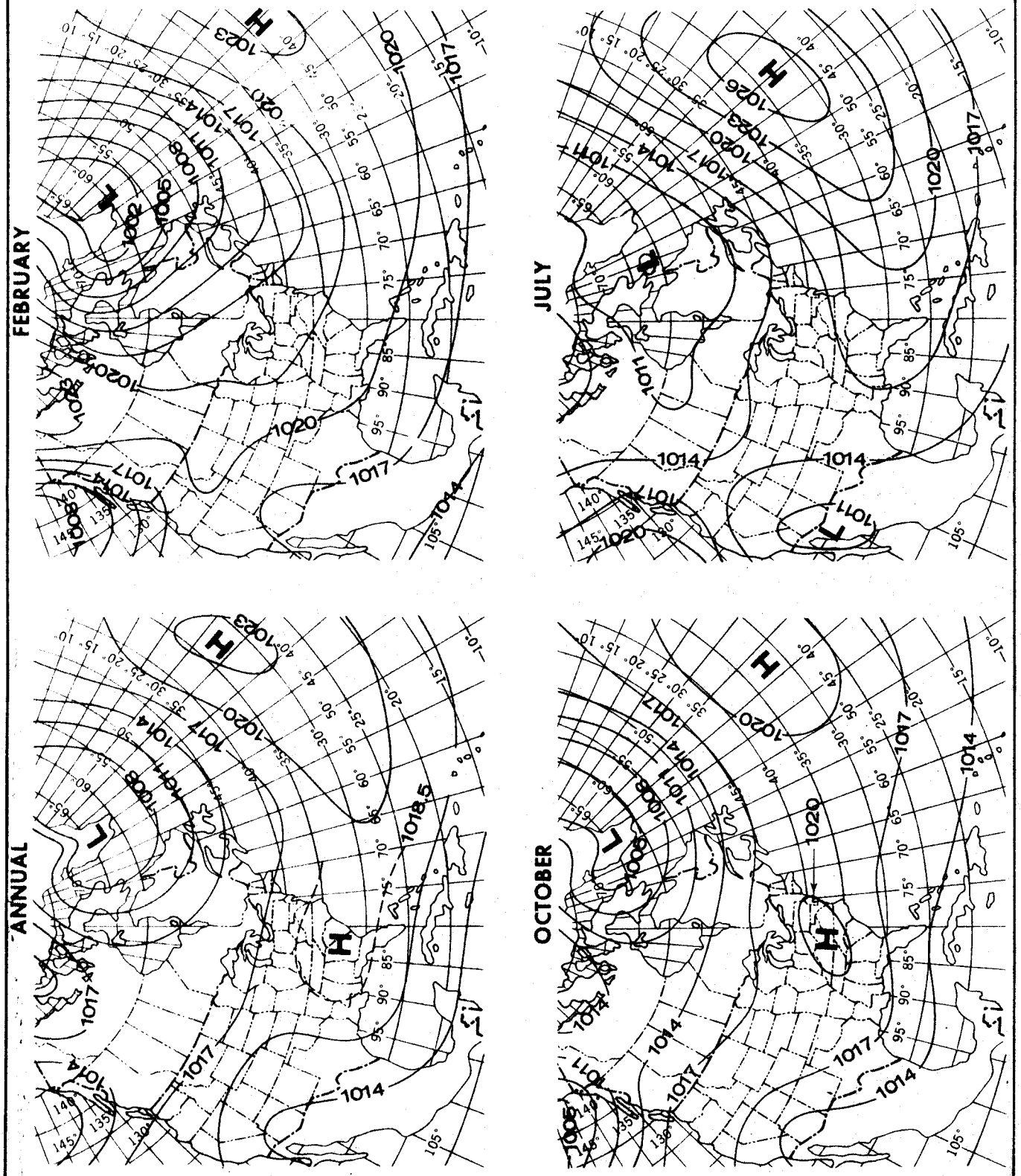


Figure 1.2-2
NORMAL SEA LEVEL PRESSURE
DISTRIBUTION OVER NORTH AMERICA
AND THE NORTH ATLANTIC OCEAN

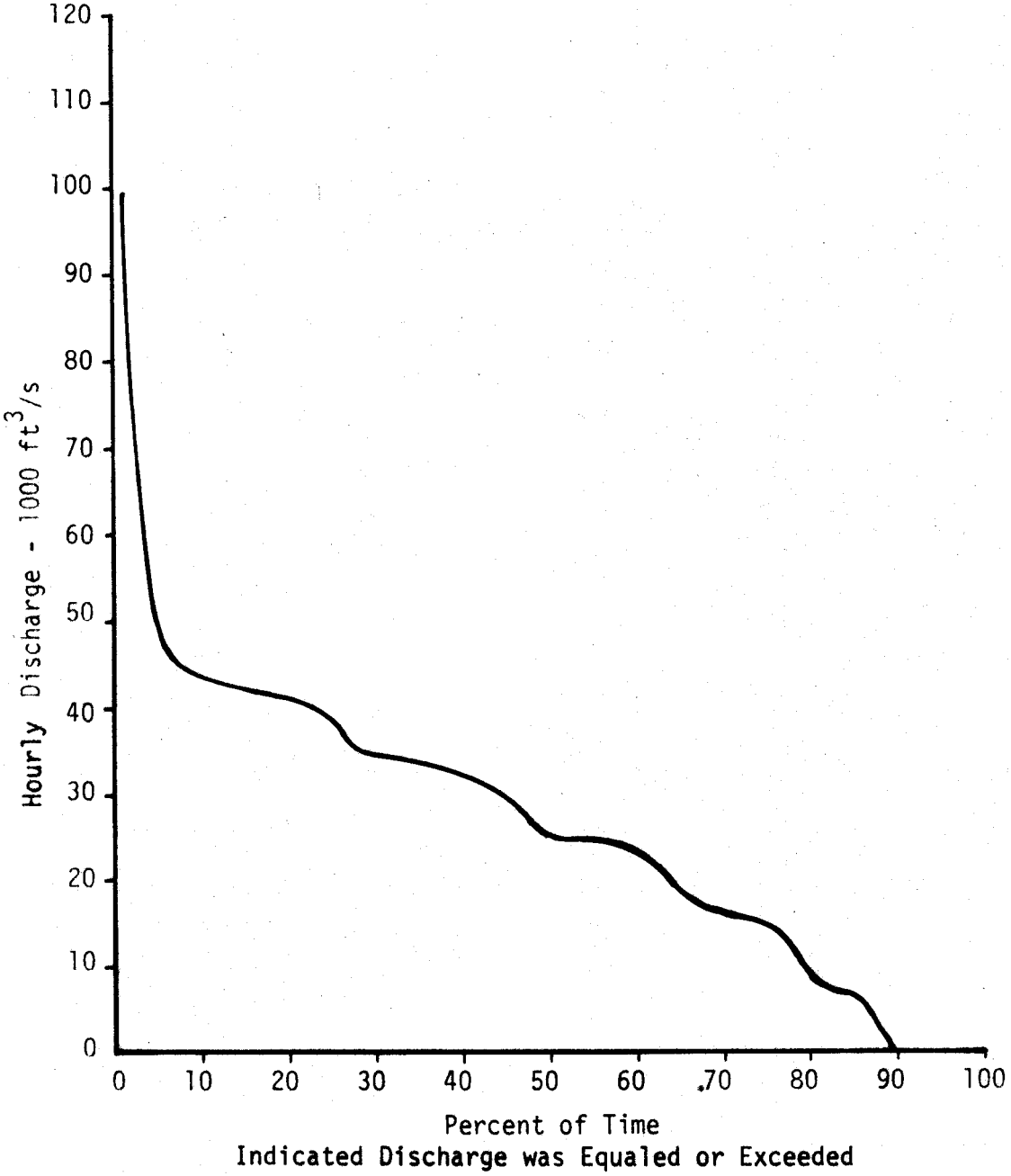


Figure 1.2-3

WATTS BAR DAM HOURLY FLOW
TEN YEARS OF RECORD
1959-1968

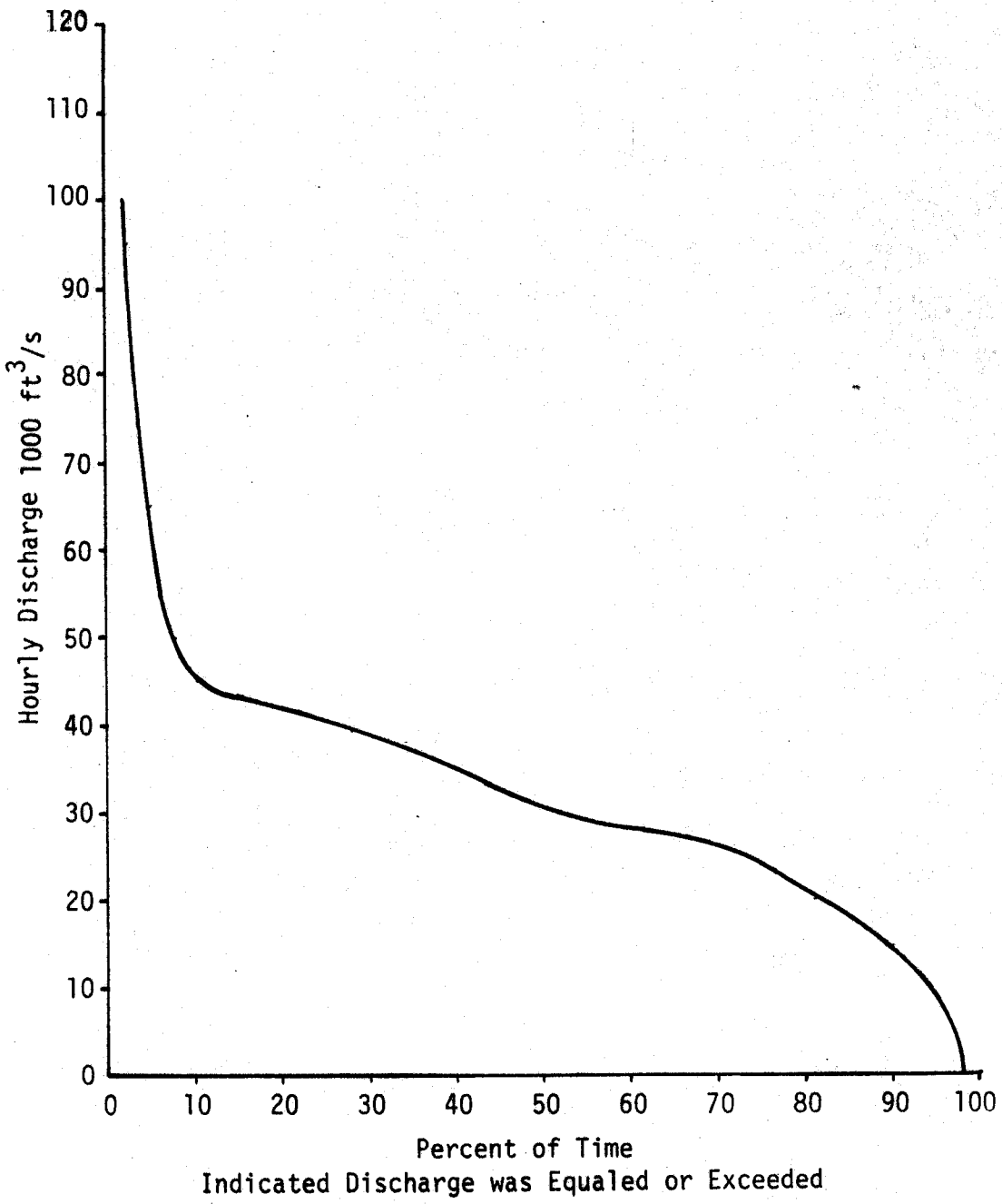
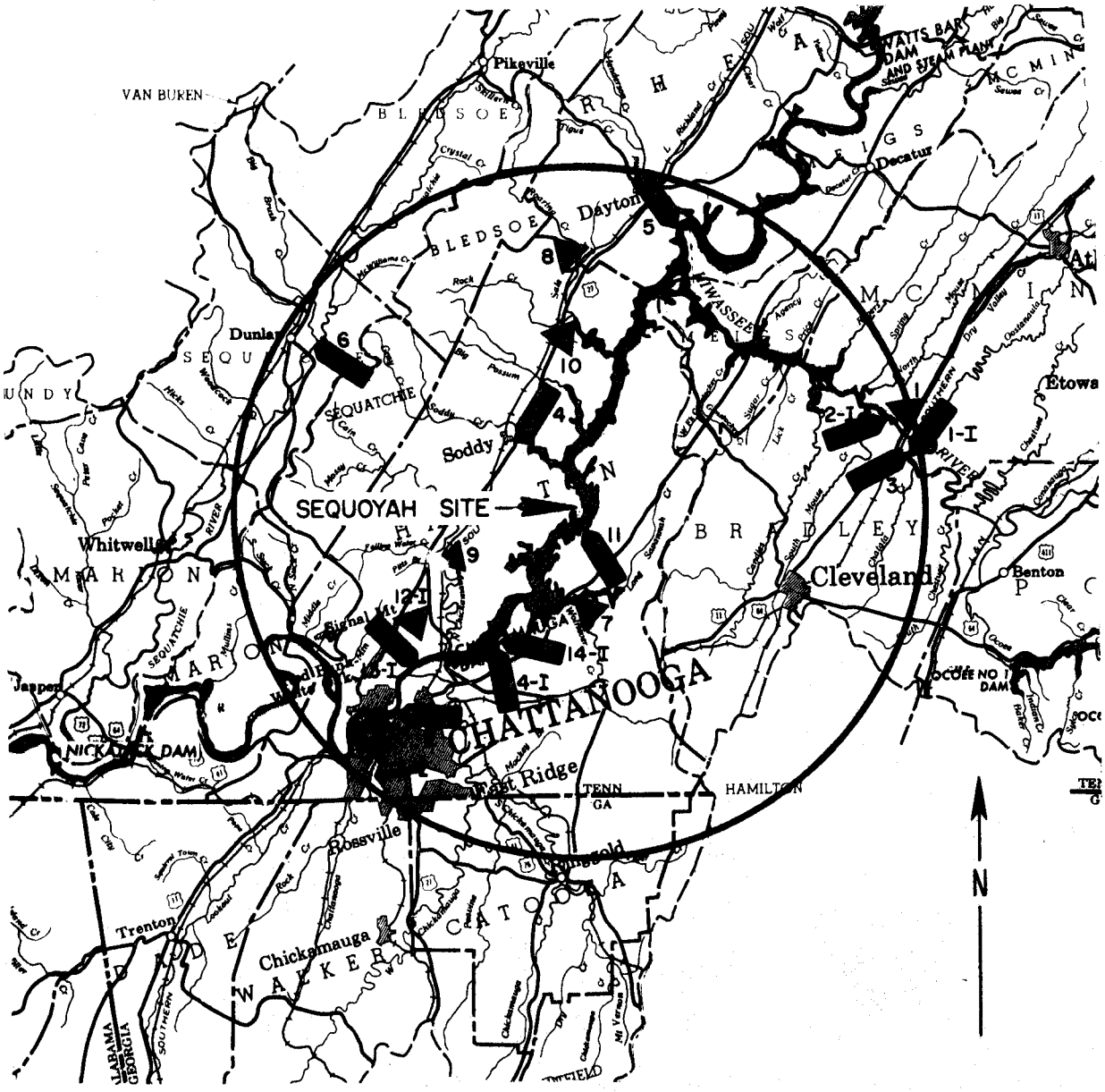


Figure 1.2-4

CHICKAMAUGA DAM HOURLY FLOW
TEN YEARS OF RECORD
1959-1968



SURFACE WATER SUPPLY

GROUND WATER SUPPLY

I INDUSTRAL WATER SUPPLY USED FOR POTABLE WATER

NOTE: THE NUMBER ASSOCIATED WITH THE TYPE OF SUPPLY CORRESPONDS TO THE NUMBERING IN TABLES 8 AND 9

Figure 1.2-5

PUBLIC WATER SUPPLIES WITHIN TWENTY MILE RADIUS OF THE SEQUOYAH SITE

SCALE OF MILES

10 5 0 10 20

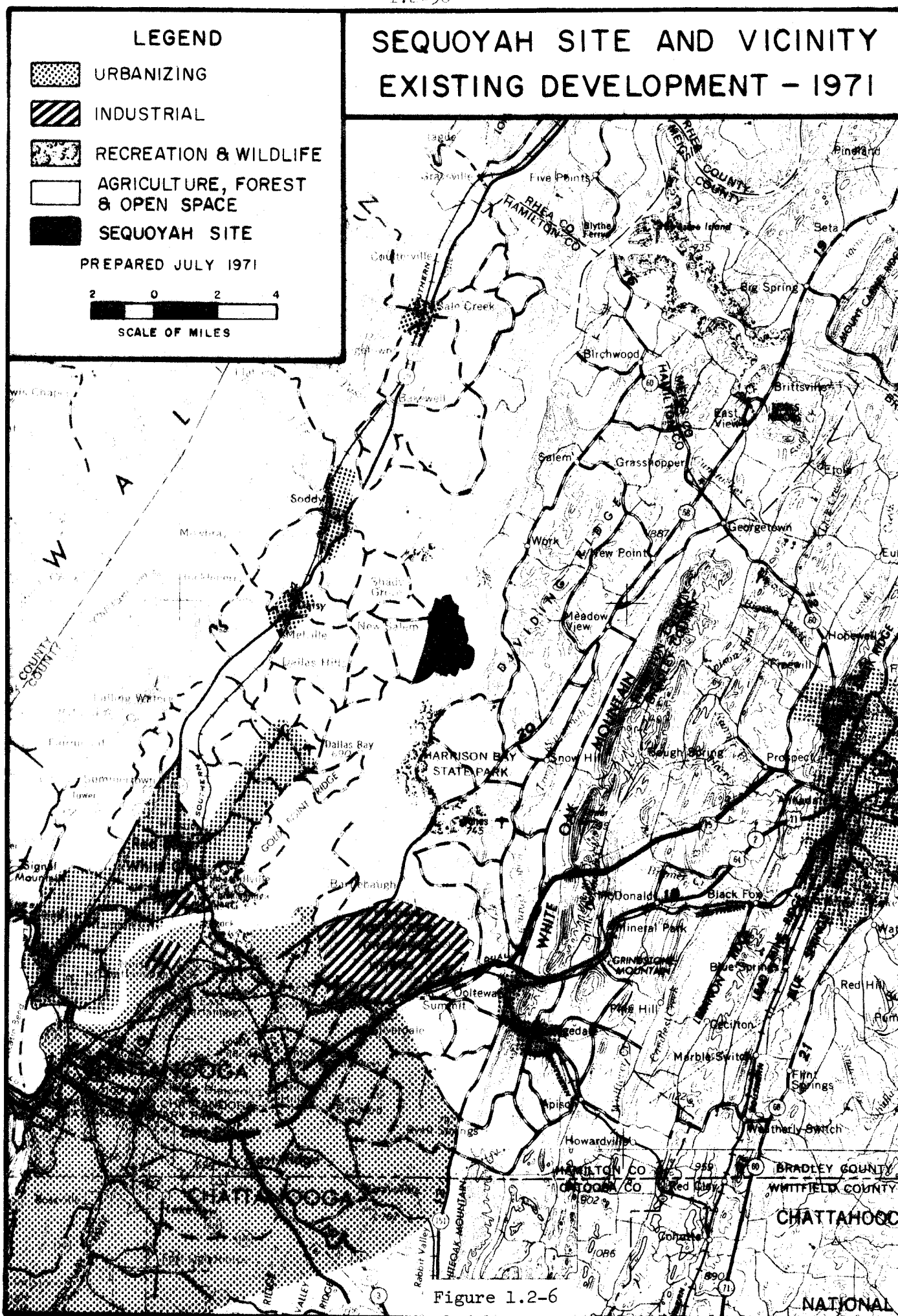

SEQUOYAH SITE AND VICINITY
EXISTING DEVELOPMENT - 1971
LEGEND
URBANIZING
INDUSTRIAL
RECREATION & WILDLIFE
AGRICULTURE, FOREST & OPEN SPACE
SEQUOYAH SITE
PREPARED JULY 1971
2 0 2 4
SCALE OF MILES
Five Points
Blythe Ferry
Beta
Big Spring
Birchwood
Brittsville
East View
Salem
Grasshopper
Georgetown
Work
New Point
Meadow View
Soddy
Dallas Bay
HARRISON BAY STATE PARK
Snow Hill
Rough Spring
Prospect
Black Fox
Mineral Park
GRINDSTONE MOUNTAIN
Blue Springs
Red Hill
Pine Hill
Decatur
Marble Switch
Flint Springs
Apison
Weatherly Switch
Howardville
HAMILTON CO
BRADLEY COUNTY
WHITFIELD COUNTY
CHATTAHOOCHEE
Cohutta
NATIONAL
CHATTANOOGA
Signal Mountain
Rabbit Valley
WHITE OAK MOUNTAIN
DAVIDING
RHEA CO
HAMILTON CO

Figure 1.2-6

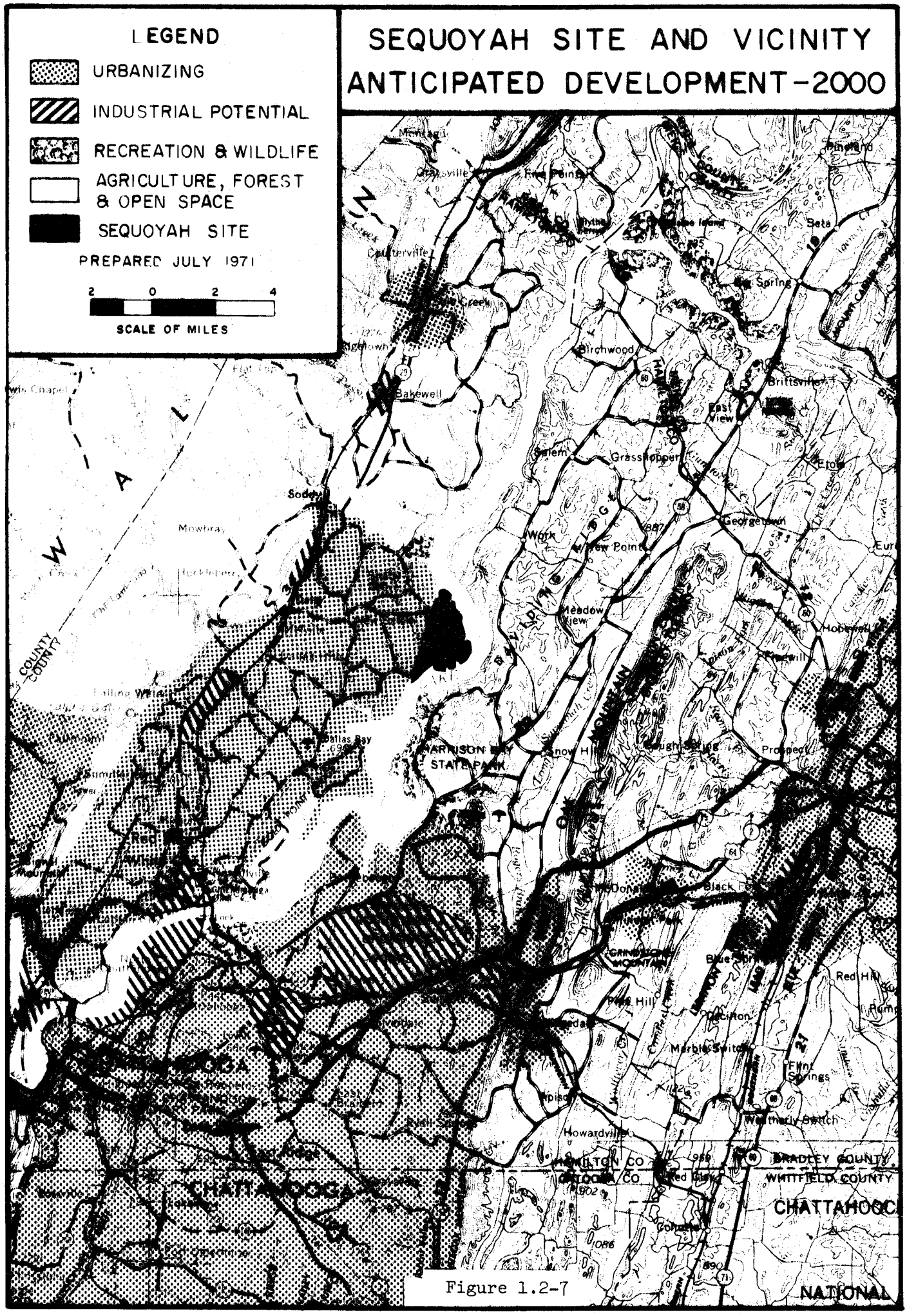

LEGEND
URBANIZING
INDUSTRIAL POTENTIAL
RECREATION & WILDLIFE
AGRICULTURE, FOREST & OPEN SPACE
SEQUOYAH SITE
PREPARED JULY 1971
2 0 2 4
SCALE OF MILES
SEQUOYAH SITE AND VICINITY
ANTICIPATED DEVELOPMENT-2000
Birchwood
Bakewell
Brittsville
East View
Salem
Grasshopper
Georgetown
Meadow View
Prospect
Black
Red Hill
Decatur
Marble Switch
Flint Springs
Howardville
HAMILTON CO
BRADLEY COUNTY
WHITFIELD COUNTY
CHATTANOOGA
NATIONAL

Figure 1.2-7

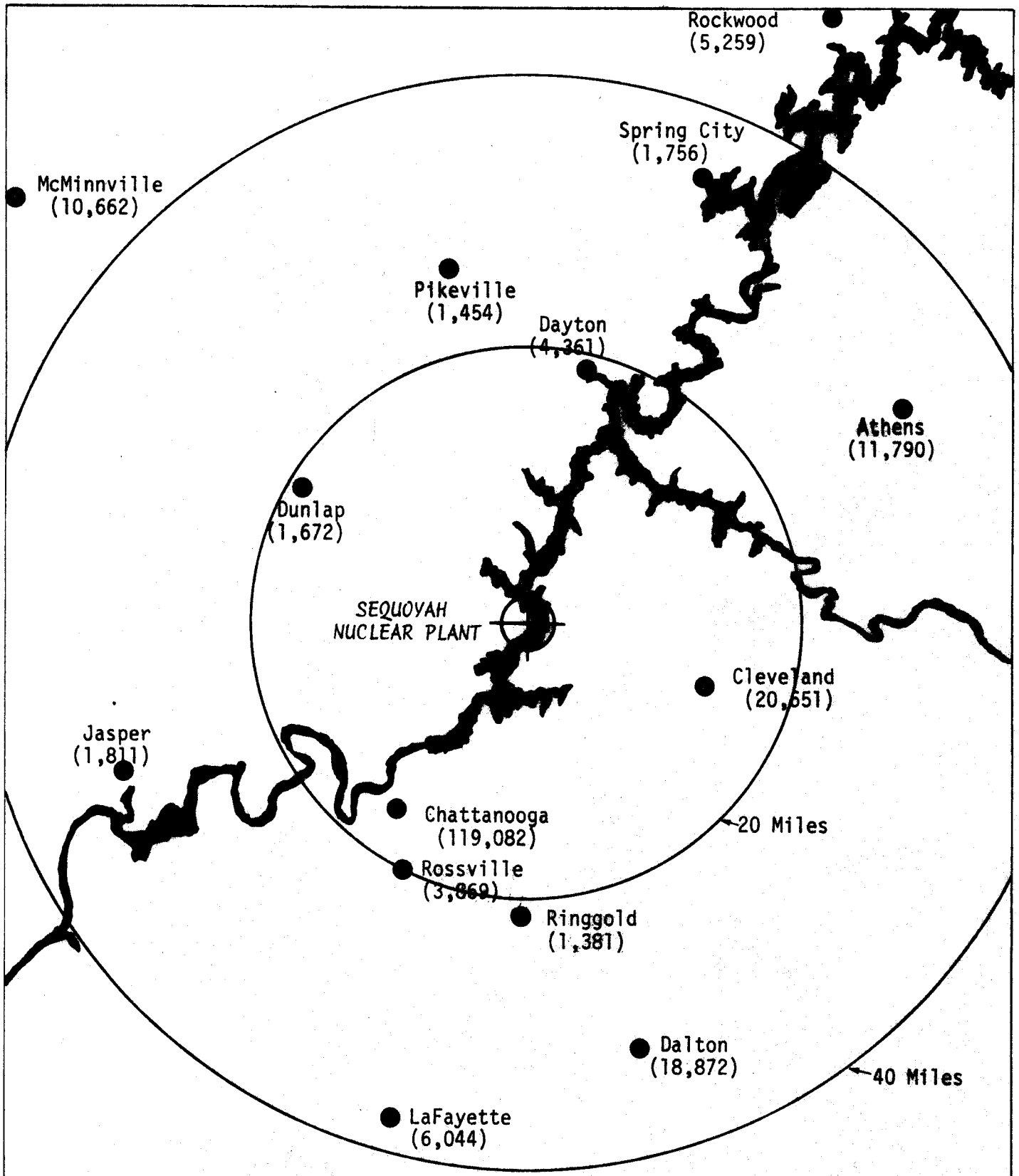


Figure 1.2-8

MAJOR POPULATION AREAS
SEQUOYAH NUCLEAR PLANT

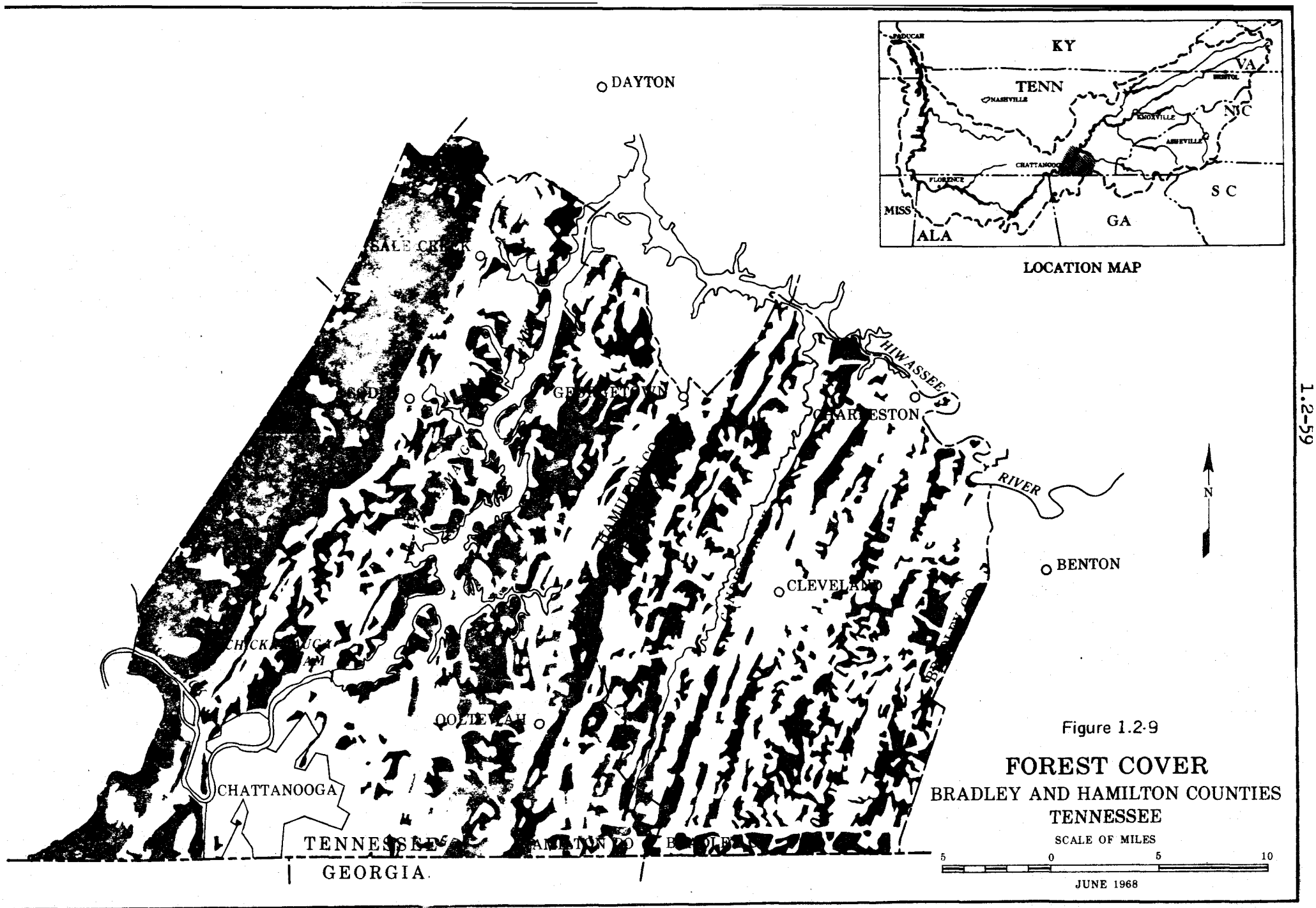


Figure 1.2-9

FOREST COVER
BRADLEY AND HAMILTON COUNTIES
TENNESSEE

MAPS AND SURVEYS BRANCH

GMS 433A556

1.3 Electric Power Supply and Demand - TVA is the power supplier for an area of approximately 80,000 square miles containing about six million people. TVA generates, transmits, and sells power to 160 municipalities and rural electric cooperatives which, in turn, retail power to their own customers. The approximate area served by these distributors is shown in figure 1.0-1. These distribution systems, which purchase their power requirements from TVA, serve more than two million electric customers, including homes, farms, businesses, and most of the region's industries. TVA also supplies power directly to 46 industries which have large or unusual power requirements and to 11 Federal installations, including the Atomic Energy Commission plants at Oak Ridge, Tennessee, and Paducah, Kentucky.

The importance of an adequate supply of power on the TVA system is by no means limited to electric consumers in the TVA area. The TVA power system, which with 21.9 million kilowatts of installed generating capacity is the Nation's largest, is interconnected at 26 points with neighboring systems with which TVA exchanges power. The TVA system is, in effect, part of a large power network. In a time of power emergency, operation of the TVA power system could have a definite impact on power supply conditions from the Great Lakes to the Gulf of Mexico, and from New England to Oklahoma and Texas.

During the past 20 years, loads on the TVA power system have increased approximately 7 percent per year. This rate of growth in power requirements has meant that the capacity of the generating and transmission system has been doubled every 10 years. Until the end of World War II, most of TVA's generating capacity was hydroelectric. By

that time, however, most of the suitable hydroelectric sites had been developed, and beginning in 1949 substantially all of the capacity increases were met by the construction of fossil-fueled plants. In the middle 1960's large-scale nuclear plants had become feasible, and TVA began to take steps to add nuclear capacity to its system. TVA has also begun providing pumped-storage and gas turbine capacity to meet system peak loads. Table 1.3-1 shows the TVA system capacity makeup as of June 30, 1973.

The amount of electricity generated in 1965 to meet customer requirements for power was 74.5 billion kilowatthours. By 1970 annual electric generation for customers' needs had reached 92.7 billion kilowatthours. Generating needs are expected to reach 135 billion kilowatthours by 1975.

Estimates of future TVA loads are prepared by projecting historical trends for a number of geographic and class of service categories, taking into account changes and factors affecting use. Other forecasting techniques are used, where possible, to provide a system of checks on the above method. Forecasting is preceded by analysis and adjustment of historical data and background preparation including a review of industry conditions, a review of current appliance sales and housing trends, a study of possible new loads, and other factors such as the outlook for the national and regional economies.

Peak load energy forecasts of large commercial and industrial loads served by municipalities and cooperatives are individually prepared on the basis of factors such as past history, stated plans for operating levels, type of product, and contract demand.

Large industrial and Federal loads which are directly served by TVA are also forecast on an individual basis. Industrial loads are grouped according to industry type, and known expansion and allowance for growth are considered.

1. Power needs - The TVA power system is a winter and summer peaking system with the highest annual peak loads in the TVA service area usually occurring between November and March. Due to seasonal exchange arrangements with other power systems, however, the loads which the TVA generating capacity must actually serve during the remainder of this decade will be greater in the summer than in the preceding winter. Table 1.3-2 indicates TVA's expected power supply outlook during the 1974-82 peak load seasons based on the current capacity installation schedules (June 1976, Sequoyah Unit 1; February 1977, Sequoyah Unit 2).

The power supply situation of the peak periods in the interim from summer 1976 through summer 1980 is expected to be only marginally adequate to supply TVA's firm load with the current installation schedule. In the late 1970's TVA's power supply is expected to have deficiencies as shown in the following tabulation:

	Margins				
	Desired		Available		Deficiency
Period	MW	%	MW	%	MW
Summer 1976	4779	20.6	4349	18.7	430
Winter 1976-77	5349	23.2	4308	18.7	1041
Summer 1977	5028	20.7	4454	18.4	574
Winter 1977-78	5091	20.9	4183	17.2	908
Winter 1979-80	5579	20.5	4793	17.6	786

Additional unit delays in the 1976 to 1980 period would create an extremely critical power supply.

TVA's desired reserve margins are determined by utilization of the loss of load probability method which has been adapted to the characteristics of the TVA system. TVA's planning criteria require maintenance of a desired reserve margin within a reliability risk level of one day in 10 years and any reduction below these margins increases the risk that firm load cannot be served.

2. Consequences of delays - Any delay in operation of the Sequoyah units could result in the inability of the TVA system to adequately meet its obligations during the 1976 and 1977 summer peak periods and the 1976-77 and 1977-78 winter peak periods. The total consequences of such delays of the Sequoyah Nuclear Plant would be determined by the extent of these delays and the date when such delays were identified.

The following tabulation indicates the amount by which reserves on the TVA system will be inadequate during various peak load periods between 1975 and 1977, postulating a delay of 6 months for each of the Sequoyah units from their current schedule. (A delay of unit 1 results in an equal delay in unit 2 since the construction is sequential.)

	TVA System Reserve[a] Deficiencies from Desired Margins Due to Unit Delays of 6 Months megawatts
Winter 1975-76	327
Summer 1976	1,461
Winter 1976-77	1,041
Summer 1977	1,619

a. Any Sequoyah unit delays would result in a serious deficiency of margins available for scheduled maintenance for all TVA generating units during the period of delay.

The deficiencies shown are based on the assumption that the winter peak occurs in January and the summer peak occurs in August since these are the months having the higher probability of peak occurrance. The winter peak has occurred as early as November and the summer peak as early as June.

The following tabulation indicates the expected reserve deficiencies on the TVA system during various peak load seasons between 1976 and 1978, postulating a delay of 12 months for each of the Sequoyah units from their current schedule.

	TVA System Reserve Deficiencies from Desired Margins Due to Unit Delays of 12 Months megawatts
Winter 1975-76	327
Summer 1976	1,461
Winter 1976-77	2,078
Summer 1977	1,619
Winter 1977-78	1,921

With a 12-month delay in Sequoyah units and the resulting deficiencies identified above, TVA would be unable to maintain a reliable supply of bulk power to serve firm load during the 1976-78 period. The magnitudes of the deficiencies for this period are more than could be covered by assistance from neighboring utilities, particularly the summer 1976 and summer 1977 peak period since neighboring utilities are summer-peaking systems.

In addition to jeopardizing the ability to serve firm load which would be caused by the 12-month delay of both units, a serious deficiency of margin available for scheduled maintenance for all of TVA's generating units would result.

Deficiencies of the magnitude caused by delays of the Sequoyah units must be replaced either by installing alternative capacity on the TVA system or importing power from other utility systems; otherwise, the reliability of power supply to TVA's customers will be drastically reduced. It is unlikely that additional capacity other than short leadtime generating capacity could be installed to meet these deficiencies. Power in the magnitude being considered is not expected to be available from other utilities when it is needed on the TVA system.

The economic costs of any Sequoyah delays would consist of two parts: (1) cost of replacement capacity, and (2) increased production expense during the delay period because of unavailability of low-cost nuclear energy.

The estimated investment cost of 1,000 MW of replacement capacity which could be installed for the 1976-77 period is approximately $120 million. Annual fixed charges of about $12 million on such an investment must be borne by consumers in the form of higher rates until the effect of these additions can be absorbed in later years by system growth. The value of these fixed charges (assuming an 8 percent discount rate and a discount period of 3 years) would be about $30.9 million.

Fuel, operating, and maintenance expense for the Sequoyah nuclear units is estimated to cost about 2.8 mills per kWh

during the 1976-77 period, while replacement energy which would be used in lieu of this nuclear energy in the event of delays would cost from 3.5 to 10 mills per kWh, depending on the source of this replacement energy. Studies of the effects of Sequoyah unit delays indicate that each month's delay on these units would result in increased production expenses on the TVA system of approximately $2.9 million.

In addition to these economic costs, each month's delay on the two Sequoyah nuclear units could require that approximately 590,000 tons of additional coal and 7 million gallons of oil be burned in plants on the TVA system or other systems to replace the lost nuclear energy. This could have an adverse environmental impact in terms of increased emissions of particulates, sulfur dioxide, and other materials to the atmosphere.

In summary, delays of the Sequoyah Nuclear Plant will have a twofold effect on the TVA power system:

1. Costs to TVA's customers would be increased by at least $2.9 million for each month of delay, assuming the delay did not require the installation of combustion turbines or combined-cycle units. If additional generating capacity were required to offset deficiencies due to Sequoyah delays, costs to TVA's consumers over and above those shown above could be increased by $31 million. These costs could total about $66 million for a 12-month delay.
2. Increased operation of TVA's older, higher cost fossil-fired units would be required during the period of further Sequoyah delays. Such increased operation would result in

the increased emission of particulates, sulfur dioxide, and other materials into the atmosphere.

The analysis shown shows that TVA cannot carry out its statutory obligation of providing an ample supply of electricity for the TVA region without the Sequoyah Nuclear Plant. Without the plant the reliability risk level would be increased to a loss of load probability of nearly one day per year, which is clearly unacceptable, when the accepted planning criteria is one day in 10 years.

Table 1.3-1

TVA SYSTEM CAPACITY

(as of June 30, 1973)

Plant	Number of Units		Nameplate Capacity-kW Units	Total
TVA Thermal				
Thomas H. Allen[a]	3		330,000	990,000
Thomas H. Allen (Gas Turbines)	20			620,800
Bull Run	1		950,000	950,000
Colbert	5	2 @	200,000	1,396,500
		2 @	223,250	
		1 @	550,000	
Colbert (Gas Turbines)	8			476,000
Cumberland	1	1 @	1,300,000	1,300,000
Gallatin	4	2 @	300,000	1,255,200
		2 @	327,600	
John Sevier	4	1 @	223,250	823,250
		3 @	200,000	
Johnsonville	10	4 @	125,000	1,485,200
		2 @	147,000	
		4 @	172,800	
Kingston	9	4 @	175,000	1,700,000
		5 @	200,000	
Paradise	3	2 @	704,000	2,558,200
		1 @	1,150,200	
Shawnee	10		175,000	1,750,000
Watts Bar	4		60,000	240,000
Widows Creek	8	5 @	140,625	1,977,985
		1 @	149,850	
		1 @	575,010	
		1 @	550,000	
TVA Hydro				
Apalachia	2			78,900
Blue Ridge	1			20,000
Boone	3			75,000
Chatuge	1			10,000
Cherokee	4			120,000
Chickamauga	4			108,000
Douglas	4			115,000
Fontana	3			225,000
Fort Loudoun	4			135,590
Fort Patrick Henry	2			36,000
Great Falls	2			31,860
Guntersville	4			97,200
Hiwassee	2			117,100

a. Leased January 1, 1965, from Memphis, Tennessee, Light, Gas and Water Division.

Table 1.3-1
(continued)

TVA SYSTEM CAPACITY

(as of June 30, 1973)

Plant	Number of Units	Nameplate Capacity-kW Units	Nameplate Capacity-kW Total
TVA Hydro (cont.)			
Kentucky	5		175,000
Melton Hill	2		72,000
Nickajack	4		97,200
Norris	2		100,800
Nottely	1		15,000
Ocoee No. 1	5		18,000
Ocoee No. 2	2		21,000
Ocoee No. 3	1		27,000
Pickwick	6		220,040
South Holston	1		35,000
Tims Ford	1		45,000
Watauga	2		50,000
Watts Bar	5		150,000
Wheeler	11		356,400
Wilbur	4		10,700
Wilson	21		629,840
Alcoa Hydro			
Bear Creek	1		9,000
Calderwood	3		121,500
Cedar Cliff	1		6,375
Cheoah	5		110,000
Chilhowee	3		50,000
Nantahala	1		43,200
Santeetlah	2		45,000
Tennessee Creek	1		10,800
Thorpe	1		21,600
Minor Alcoa Plants	-		6,240
Corps of Engineers Hydro			
Barkley	4		130,000
Center Hill	3		135,000
Cheatham	3		36,000
Dale Hollow	3		54,000
Old Hickory	4		100,000
J. Percy Priest	1		28,000
Wolf Creek	6		270,000

Table 1.3-2

Period	Estimated Peak Demand TVA System-MW	Interchange Delivered or Received-MW	Load Served by TVA-MW	Dependable Capacity-MW	Margin MW	Margin %
Winter 1973-74	20,750	-2,360	18,390	22,963	4,573	24.9
Summer 1974	17,990	+2,060	20,050	23,174	3,124	15.6
Winter 1974-75	21,925	-2,060	19,865	24,378	4,513	22.7
Summer 1975	19,920	+2,060	21,980	26,604	4,624	21.0
Winter 1975-76	23,700	-2,060	21,640	26,283	4,643	21.5
Summer 1976	21,170	+2,060	23,230	27,579	4,349	18.7
Winter 1976-77	25,150	-2,060	23,090	27,398	4,308	18.7
Summer 1977	22,180	+2,060	24,240	28,694	4,454	18.4
Winter 1977-78	26,400	-2,060	24,340	28,523	4,183	17.2
Summer 1978	23,300	+2,060	25,360	29,864	4,504	17.8
Winter 1978-79	27,750	-2,060	25,690	30,863	5,173	20.1
Summer 1979	24,490	+2,060	26,550	31,034	4,484	16.9
Winter 1979-80	29,300	-2,060	27,240	32,033	4,793	17.6
Summer 1980	25,730	+2,060	27,790	33,374	5,584	20.1
Winter 1980-81	30,960	-2,060	28,900	34,403	5,503	19.0
Summer 1981	27,050	+2,060	29,110	35,774	6,664	22.9
Winter 1981-82	32,650	-2,060	30,590	36,803	6,213	20.3
Summer 1982	28,400	+2,060	30,460	38,174	7,714	25.3

1.4 Environmental Approvals and Consultations - In addition to its own standards, TVA as a Federal agency is subject to comprehensive and broad-scale environmental procedures and Federal and state consultation and coordination requirements of the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321 et seq (1970) (as implemented by Executive Order 11514 (35 Fed. Reg. 4247). In addition, TVA is subject to Executive Order 11507 (35 Fed. Reg. 2573), and Office of Management and Budget Circulars A-78 and A-81, relating to the prevention, control, and abatement of air and water pollution in Federal facilities, as well as certain provisions of the Clean Air Act, as amended, 42 U.S.C.A. § 1857 (1970), and the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), which relate to the applicability of various Federal, state, interstate, or local air and water quality standards. In addition, TVA is subject to the requirements of Office of Management and Budget Circular A-95 which insure that major generating and transmission projects are coordinated from the point of view of community impact and land use planning with state and local agencies.

Public announcement of the Sequoyah Nuclear Plant construction was made on August 7, 1968. On October 10, 1968, TVA's Regional Planning Staff met with the staff of the Chattanooga-Hamilton County Regional Planning Commission (CHCRPC) to discuss the plant's impact. The discussion covered both temporary construction effects as well as the long-range impact on the development pattern.

Access to the plant site was one topic discussed at a meeting concerning the Chattanooga Beautification Plan held on January 31, 1969. TVA agreed to coordinate arrangements for access with the CHCRPC. As a

followup, preliminary designs were sent on June 4, 1969. Background information was sent to the Southeast Tennessee Development District on December 10, 1969.

Representatives of TVA's Division of Environmental Research and Development (now the Division of Environmental Planning) participated in a series of meetings concerning expected environmental effects of the Sequoyah Nuclear Plant.

1. A general review of the environmental impact expected as a result of construction and operation of the Sequoyah Nuclear Plant took place on February 13, 1970, with Dr. Marion Young, Director of the Chattanooga-Hamilton County Health Department.
2. On March 10, 1970, a discussion of environmental aspects of the Sequoyah plant was conducted with personnel from the Tennessee Department of Public Health. Of particular concern were considerations regarding review of TVA plans for control of heated water discharges and potential radiological and toxicological problems expected.
3. On March 17, 1970, a meeting was held with representatives of the Tennessee Game and Fish Commission and the U.S. Fish and Wildlife Service. Points of discussion included the plant's expected impact on the aquatic environment, thermal discharge effects, radwastes, and proposed monitoring surveys, particularly as related to fish and other aquatic life.

TVA has consulted with the Fish and Wildlife Service, U.S. Department of the Interior, and the Tennessee Department of Conservation in developing plans for environmental monitoring for the Sequoyah plant.

In addition, TVA has discussed environmental monitoring plans with the Tennessee State Health Department, the Tennessee Division of Water Quality Control, the Bureau of Sport Fisheries and Wildlife, and NOAA.

Preparation of the maps showing existing and anticipated development in the vicinity of the plant site was coordinated with CHCRPC and the Southeast Tennessee Section of the Tennessee State Planning Office in late July and early August 1972.

The state and regional A-95 clearinghouses have been advised of the Sequoyah Nuclear Plant; the draft environmental statement has been submitted for their review, and their comments are incorporated into this document. In addition, the State Liaison Officer of Tennessee (Tennessee Historical Commission) was contacted and concurred that there are no properties on the National Register of Historic Places that would be affected by the construction of the Sequoyah Nuclear Plant.

The new transmission line routes for Sequoyah Nuclear Plant were closely coordinated with the following officials, commissions, departments, and agencies:

Tennessee State Planning Commission
Tennessee Recreation Department
Tennessee Department of Conservation
Southeast Tennessee Development District
Sequatchie Valley Planning and Development Agency
Chattanooga-Hamilton County Regional Planning Commission
Hiwassee Land Company
Soddy-Daisy City Manager
Grundy County Judge
Upper Duck River Development Association
Coffee County Judge
Moore County Planning Commission
Franklin County Judge
Bedford County Judge
Franklin County Planning Commission
Bradley County Planning Commission
Tennessee State Highway Department
National Park Service
Federal Aviation Agency
U.S. Corps of Engineers

In addition to the recorded consultations outlined above, TVA will continue to discuss the Sequoyah project with local officials and organizations to minimize impacts. No unresolved problems or objections have resulted from this series of meetings.

Application forms for National Pollutant Discharge Elimination System permits for construction waste treatment facilities were filed with the Region IV Environmental Protection Agency office on April 16, 1973.

1.5 Emergency Planning - TVA has developed a Radiological Emergency Plan (REP) which sets forth the policies, purposes, delegations, standards, guidelines, and, where feasible, specific instructions necessary for TVA to discharge its responsibilities during a radiological emergency in order to comply with pertinent directives applicable to the protection of the health and safety of the public and TVA personnel, plants, and properties.

The REP consists of the basic document and annexes that recognize different levels of accidents and their consequences and corresponding actions taken. The basic document contains program delegations and broad guides which apply generally to all TVA nuclear operations. Annexes to the basic document will include detailed radiological emergency plans for each TVA nuclear plant. In addition, the annexes will contain a Radiological Emergency Medical Assistance Plan for dealing with employees who might be injured during an accident. A site radiological emergency plan has been prepared for the Sequoyah Nuclear Plant.

For the Sequoyah Nuclear Plant, emergency medical assistance to receive contaminated patients has been arranged with Erlanger Hospital, Chattanooga, Tennessee. Agreement has also been reached with the Oak Ridge Associated Universities Hospital to receive highly irradiated patients.

TVA is coordinating all aspects of the REP with the appropriate state agencies, such as the Departements of Public Health and Public Safety. The Sequoyah radiological emergency plan defines the details of authority and responsibility of all offsite agencies involved in an emergency situation. Responsibilities such as evacuation, housing, and feeding evacuees are defined so that the responsible agencies may take

the initiative in expeditiously executing their phases of the plan. The standards for determining emergency situations and the procedures used during an emergency are consistent with regulatory programs of state and other Federal agencies. To ensure that their latest recommendations are considered, TVA maintains liaison with these agencies.

In developing the Radiological Emergency Plan, meetings have been held with the State Health Departments of Alabama, Georgia, South Carolina, and Tennessee to ensure workability of the plan and delegation of responsibility, authority, and emergency assignments. In addition, the State Health Departments of Kentucky, Illinois, Indiana, and North Carolina have been contacted and arrangements made for participation in the event of a transportation accident.

Each state through which radioactive material from a TVA plant is transported either has or will have a radiological assistance plan for use in the event of a transportation accident within its jurisdiction. These plans have been or will be obtained and incorporated in the REP as they are available. The plans will be completed prior to shipment of radioactive material from the facility.

Contacts have also been made with the appropriate Atomic Energy Commission Operations Offices to ensure that assistance can be obtained through the Interagency Radiological Assistance Plan, if necessary.

The Eastern Environmental Radiation Laboratory, EPA, has agreed to provide additional analytical services in the event of an accident if these services are not available within TVA.

Written agreement among participating state and Federal agencies and TVA will be obtained outlining each agency's responsibilities.

The individual states' health department radiological assistance plans will be incorporated as an annex to the TVA Radiological Emergency Plan.

1. Meetings with outside agencies - Representatives of TVA have met or will meet with representatives of the following states to discuss the plans for radiological emergencies which might result as a consequence of the operation of the Sequoyah Nuclear Plant: Georgia, South Carolina, Tennessee, Kentucky, North Carolina, Alabama, Indiana, and Illinois. Other agencies, such as the Environmental Protection Agency and the Atomic Energy Commission, will be contacted where necessary.

2. Responsible agencies to be notified in case of a transportation accident - The shift engineer shall receive notification of transportation accidents. If there has been a leakage of radioactive material, he will notify the Central Emergency Control Center director through the TVA load dispatcher. The director will then alert the TVA radiological monitoring team and notify appropriate key persons in the states involved, as well as Federal agencies such as EPA, AEC, and DOT. If there is definitely no leakage, the shift engineer will notify the plant superintendent.