NPS FORM 10-900-A
(Aug. 2002)

OMB Approval No. 1024-0018
(Expires Jan. 2005)

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number _____ Page _____

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 04000545 Date of Listing: May 24, 2004

Property Name: Calderwood Hydroelectric Development

County: Blount State: Tennessee

_____
Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

for Daniel J. Vivian
Signature of the Keeper

May 24, 2004
Date of Action

Amended Items in Nomination:

Section 8. Statement of Significance
Military is hereby removed as an area of significance.

The Tennessee State Historic Preservation Office was notified of this amendment.

DISTRIBUTION:
National Register property file
Nominating Authority (without nomination attachment)

NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES REGISTRATION FORM

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Calderwood Hydroelectric Development

other names/site number N/A

2. Location

street & number 314 Growdon Boulevard . not for publication N/A

city or town Calderwood vicinity N/A

state Tennessee code TN county Blount and Monroe code 009 & 123 zip code 37801

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this _X__ nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property _X__ meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant ___ nationally ___ statewide _X_ locally. (___ See continuation sheet for additional comments.)

Herbert L. Harper 4/15/04

Signature of certifying official Date

DSHPO Tennessee Historical Commission
State or Federal agency and bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting or other official Date

State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is:

Daniel J. Vivian 5/24/04

_✓_ entered in the National Register
___ See continuation sheet
____ determined eligible for the National Register
___ See continuation sheet.
____ determined not eligible for the National Register
____ removed from the National Register
____ other (explain):

for

Signature of Keeper Date of Action

5. Classification

Ownership of Property (Check as many boxes as apply)

_X_ private
___ public-local
___ public-State
___ public-Federal

Category of Property (Check only one box)

___ building(s)
_X_ district
___ site
___ structure
___ object

Number of Resources within Property
(Do not include previously listed resources in the count).

Contributing	Noncontributing	
_5___	_1___	buildings
_0___	_0___	sites
_2___	_0___	structures
_0___	_0___	objects
_7___	_1___	Total

Number of contributing resources previously listed in the National Register _5_

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.)

__Historic Resources of the Tapoco Hydroelectric Project_

6. Function or Use

Historic Functions (Enter categories from instructions)

_INDUSTRY/PROCESSING_____	_Energy facility_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Current Functions (Enter categories from instructions)

_INDUSTRY/PROCESSING_____	_Energy Facility_____
_____	_____
_____	_____
_____	_____
_____	_____

7. Description

Architectural Classification (Enter categories from instructions)

_LATE 19TH & EARLY 20TH CENTURY REVIVALS/Colonial Revival_____
_____
_____

Materials (Enter categories from instructions)

foundation	___CONCRETE_____
roof	_METAL/Aluminum_____
walls	_BRICK_____ _____
other	_TERRA COTTA, STEEL_____

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

_X__ A Property is associated with events that have made a significant contribution to the broad patterns of our history.

____ B Property is associated with the lives of persons significant in our past.

_X__ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

____ D Property has yielded, or is likely to yield information important in prehistory or history.

Criteria Considerations
(Mark "X" in all the boxes that apply.) NA

____ A owned by a religious institution or used for religious purposes.

____ B removed from its original location.

____ C a birthplace or a grave.

____ D a cemetery.

____ E a reconstructed building, object, or structure.

____ F a commemorative property.

___ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions).
_ENGINEERING_____
_ARCHITECTURE_____
_MILITARY_____
_INDUSTRY_____

Period of Significance
____ 1930 - 1953_____

Significant Dates
_1930_____

Significant Person
(Complete if Criterion B is marked above)
__N/A_____

Cultural Affiliation
__N/A_____

Architect/Builder
ARCHITECT: Karpov, A.V._____
BUILDER: Tapoco, Inc. _____

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS)
___ preliminary determination of individual listing (36 CFR 67) has been requested.
_X_ previously listed in the National Register
___ previously determined eligible by the National Register
___ designated a National Historic Landmark
___ recorded by Historic American Buildings Survey # _____
___ recorded by Historic American Engineering Record # _____

Primary Location of Additional Data
_X_ State Historic Preservation Office
___ Other State agency
___ Federal agency
___ Local government
___ University
___ Other

10. Geographical Data

Acreage of Property _ 195 acres_ Calderwood 148 SW and Tapoco 149 NW

UTM References
(Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	17	228616	3933562	2	17	230009	3931636
3	17	229160	3931052	4	17	228037	3933100

___ See continuation sheet.

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title_Philip Thomason/Teresa Douglass_____

organization_Thomason and Associates_____ date_October 14, 2003_____

street & number_P.O. Box 121225_____ telephone_(615) 385-4960_____

city or town_Nashville_____ state_TN_____ zip code _37212_____

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps
A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs

Representative **black and white photographs** of the property.

Additional items
(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name _Norman Pierson/Alcoa Power Generating Inc., Tapoco Division_____

street & number__300 North Hall Road_____ telephone_865-977-3321____

city or town___Alcoa _____ state_TN____ zip code _37701-2516___

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

SUMMARY DESCRIPTION

The Calderwood Hydroelectric Development, located on the Little Tennessee River in Blount and Monroe Counties, Tennessee, was the third facility of the Tapoco Hydroelectric Project to be constructed. The facility was built between 1928 and 1930 and consists of a dam, powerhouse, pipeline, service building, and several ancillary buildings. Originally, a company village was built adjacent to the facility, and included almost two dozen dwellings, garages, a school, two churches, and a theater. None of the dwellings remain extant; however, the school, churches and theater, which were all built in the 1950s, remain standing. The Calderwood School and Theater are within the boundaries of this National Register Nomination. The churches and garages associated with the Calderwood company village are not within the boundaries of this nomination.

The Calderwood Dam was listed in the National Register on August 21, 1989, as part of the Blount County Multiple Resource Area nomination. The powerhouse, valve house, and associated tunnels and penstocks were listed in the National Register on February 9, 1990 as part of the multiple property listing, "Pre-TVA Hydroelectric Development in Tennessee, 1901-1933." This nomination adds remaining buildings and structures associated with the Calderwood Hydroelectric Development.

INDIVIDUAL PROPERTY DESCRIPTIONS

CS = Contributing Structure
CB = Contributing Building
NCS = Non-contributing Structure
NCB = Non-contributing Building

Dam, 1930 (CS)
The Calderwood Dam is a thin concrete arch design that is 232 feet in height and 916 feet in length. The dam's design is well suited to its site, which has steep rock walls that make side spillways impractical. Flood waters spill freely over the crest without contact with the dam. The design also includes a 40-foot high auxiliary dam approximately 300 feet below the main structure. Inspired by natural waterfalls, this arrangement creates a deep pool to still the water and absorb its energy without damaging the dam or the river bed. Water strikes a U-shaped deflector at the bottom of the pool, which doubles its effective depth.[1] The Calderwood Dam site contains the 570-acre Calderwood Reservoir, which has a normal elevation of 1087.8 feet and a drainage area of 1,856 square miles. The Calderwood Reservoir straddles the Tennessee-North Carolina border with about half of its area in each state. The Calderwood Dam was listed in the National Register in 1989.

Gatehouse, 1930 (CB)
On top of the Calderwood Dam is a gatehouse for controlling the water flow. The gatehouse is a two-story, poured concrete building containing mechanical equipment for the intake gate. The entrance has original two-panel steel doors. Windows on the upper floors are original twelve-light steel hinged design with original arched multi-light transoms. The interior has a poured concrete floor, walls, and ceiling. The gatehouse has not been previously listed in the National Register.

Gantry Cranes, 1930 (CS)
On top of the Calderwood Dam are two gantry cranes to raise and lower the spillway gates. The gantry crane cabs have hipped roofs, nine-light and twelve-light steel hinged windows, and steel and glass doors. The gantry cranes have not been previously listed in the National Register.

[1] "Alcoa's Hydroelectric Developments in the Smoky Mountains," 15.

Tunnel, 1930 (CS)
The Calderwood Dam is strategically located below a horseshoe bend in the river, which creates an additional 32 feet of head. A pressure tunnel 2150 feet in length carries water to a surge tank. The tunnel is lined with concrete and has an arched roof, vertical sides, and a flat floor. The tunnel was listed in the National Register in 1990.

Surge Tank, 1930 (CS)
The surge tank was excavated in a rock ledge above the powerhouse. Although the rise is lined with concrete, the surge chamber itself was blasted from solid rock. The surge tank has not been previously listed in the National Register.

Penstocks, 1930 (CS)
Three steel penstocks direct the flow of water from the pressure tunnel through the valve house to the powerhouse turbines. The penstocks are only exposed inside the valve house. The penstocks were listed in the National Register in 1990.

Powerhouse, 1930 (CB)
Approximately one mile downstream from the dam is the Calderwood Powerhouse. The powerhouse is situated in a narrow space between the river and the cliff, and is of brick, steel, and reinforced concrete construction. It contains three vertical Francis turbine units and generators. Two are original to the powerhouse; the third was added in 1938 as upstream storage developed. The units have a total capacity of 121.5 MW, and the total station hydraulic capacity is 8000 cfs. The Calderwood facility operates as a daily cycle, peaking facility, and uses flow delivered from Tapoco's Cheoah (North Carolina) Reservoir. The powerhouse was listed in the National Register in 1990.

The powerhouse is a two-story, rectangular plan concrete and brick building, constructed with Colonial Revival style influences. The powerhouse has a poured concrete foundation, and an exterior of six-course common bond brick. Brick pilasters with terra cotta capitals divide each window bay. The upper facade of each pilaster has terra cotta panels of bound stalk design. At the roofline is a terra cotta cornice. Each bay has a lower vent panel with concrete sills and soldier course lintels. The vent openings have louvered aluminum vents. Above the vent openings are original 72-light steel hinged windows. These windows have concrete sills and soldier course lintels. Dividing the vent openings and first floor windows are brick spandrels of raised stretcher bond brick. The upper floor windows are thirty-light fixed steel design with multi-light arched transoms. The window bays are outlined with soldier and sailor course brick. Between the first and second floor windows are brick spandrels of dark colored stretcher bond brick.

The main (west) facade of the powerhouse is eight bays in width with windows divided by brick pilasters. The lower panel vents on the west facade were added in 1997, replacing original windows. The south and north facades have two window bays similar to those on the west facade. The north facade of the powerhouse has a large entrance with a steel roll-up door. Above this entrance is a window bay with a thirty-light window of fixed steel design. This window is outlined with an arch of brick soldier and sailor courses, and has a multi-light transom. Below the windows are a brick spandrel panel with dark colored raised brick and a concrete sill. The west bay of this facade has a pedestrian entrance with an original six-light steel and glass door. Above the door is an arched transom and the door is set within a brick arch and surround. Above the entrance is an original metal canopy. Above the door is an original thirty-six-light fixed steel window that rests on a concrete sill. In the upper facade is an original thirty-light steel fixed window and multi-light transom. Between the two windows is a brick spandrel panel.

The east facade of the powerhouse has an attached original one- and two-story, poured concrete wing. This wing lacks fenestration on the south and east facades. The powerhouse itself on the east facade has similar bays to the west facade but lacks windows. Each brick bay is outlined with a brick arch of soldier and sailor brick courses. The north facade of the two-story wing has an original four-light steel and glass paneled door. Windows are original nine-light steel hinged design on both floors with concrete sills. Over the entrance is an original steel awning.

The interior of the powerhouse has a tile floor, poured concrete and brick walls, and a steel truss and steel ceiling. Extending the length of the building is an elevated steel track and crane. Interior doors are original four-light steel and glass design. The interior has three

Francis turbines with Westinghouse A.C. generators and Allis-Chalmers hydroturbines. The interior of the powerhouse's two-story wing has an added linoleum floor, poured concrete walls, and dropped acoustical tile ceiling.

Valve House, 1930 (CB)
To the east of the powerhouse is the valve house, which controls the water intake from the penstocks. The valve house's main (west) facade has seven bays including an entrance bay and six window bays. Each window bay has original sixty-light steel hinged windows with opaque glass. The windows rest on concrete sills and have concrete transom bars. The transoms above the windows are arched with multi-light steel windows. The arched window is recessed within the exterior wall. Dividing the window bays on the west facade are concrete pilasters with Doric motif capitals. On the north and south facades of the valve house are similar window bays with flanking Doric pilasters. At the roofline is a concrete cornice. The entrance bay of the valve house has an original two-panel steel door. On the north facade, the original two-panel steel doors were replaced by a steel roll-up door in 2000. Above the door is a concrete lintel and transom. The east facade of the valve house is banked into the side of the mountain and lacks fenestration. The valve house interior has poured concrete walls, a concrete ceiling with steel rafters, and a concrete floor. The interior has three steel penstocks with valve operating equipment. The valve equipment rests on poured concrete support piers. The valve house was listed in the National Register in 1990.

Chlorination Building, ca. 1945 (CB)
To the south of the powerhouse is the chlorination building. The chlorination building is a one-story, rectangular plan brick building constructed ca. 1945. The building has a poured concrete foundation, five-course common bond brick exterior, and a flat roof of concrete. On the north facade is an entrance with a ca. 1970 wood door. The building has no other fenestration. The chlorination building has not been previously listed in the National Register.

Service Building, 1930 (CB)
To the north of the powerhouse is the Calderwood Service Building, which is a one-story, concrete and brick veneer, Colonial Revival style building. The building has a concrete foundation, flat roof of rolled roofing, and an exterior of six-course common bond brick. On the main (E) facade is the primary entrance with original double doors of single-light glass and aluminum. Above the doors is a multi-light glass and aluminum transom. The entrance has a concrete surround with a Chippendale pediment and urn. Leading to the entrance is a concrete staircase with an original aluminum railing. Dividing the basement and first floor level is a brick beltcourse. The central ten-bay section projects from the main block of the building and at the corners are quoins. Windows are original nine-light, steel hinged design. At the roofline are brick dentils and concrete coping. On the south facade are entrances into the shop and storage wings. The shop wing has a ca. 1970 steel overhead roll-up door. The storage wing has original double doors of paneled wood design. Windows in these two wings are original, paired thirty-five-light hinged steel design with concrete sills. Similar windows are located on the west facade. On the north facade is an entrance with an original single-light glass and wood door. This facade has a basement staircase of concrete and a basement door of four-light and three-panel steel and glass design. The service building has not been previously listed in the National Register.

The interior of the building is divided into various offices, with a storage and shop wing, and large conference room. Individual offices have linoleum floors, dropped ceilings, and plaster walls. Some spaces have added wall paneling. The hallways divided the office areas have original tile floors, plaster walls, and dropped acoustical tile ceilings. The interior doors are original single-light glass and wood design with opaque glass. The large conference room has added linoleum floors, dropped ceilings, and original plaster walls. The storage wing has a concrete floor, exposed brick walls, and steel truss and paneled ceiling. The interior of this section has steel support columns. The shop area also has the same interior design.

School, 1950 (CB)
The Calderwood School was built with Colonial Revival detailing in 1950. The building has a poured concrete foundation, a flat roof of rolled roofing, and an exterior of five-course common bond brick. On the north facade are original double doors of single-light glass and wood design. Above the doors is an original four-light transom. Above the entrance is an elliptical concrete canopy and flanking the door are brick piers with quoins. The building also has corner quoins. On the east and west facades are six window bays with original

twenty-four-light, steel hinged windows. The windows have steel sills. The entrance on the south facade has original two-panel double doors. A window bay on the east facade was removed ca. 1993 and replaced with a roll-up steel door. The interior has concrete floors, wood ceilings, and concrete block walls. The interior has a central hallway with flanking classrooms and bathrooms. Most rooms retain blackboards, but the original doors are missing. The main entrance has a vestibule with original single-light glass and wood doors leading to the hallway. The school has not been previously listed in the National Register.

Theater, 1950 (CB)
The Calderwood Theater is a one-story Quonset Hut built in 1950. The building has a concrete foundation and walls and elliptical ceiling of crimped steel panels. On the main (north) facade are two entrances with original vertical board double doors. On the second floor of this facade is an exterior wall steel staircase leading to an entrance with an original vertical board door. Also on this facade is a louvered vent. On the east facade is an entrance with original steel double doors. On the south facade is a garage bay with a ca. 1990, roll-up aluminum door. This facade also has an original steel pedestrian door. The theater has not been previously listed in the National Register.

Shed, ca. 1980 (NCB)
Adjacent to the theater is a ca. 1980 implement shed.

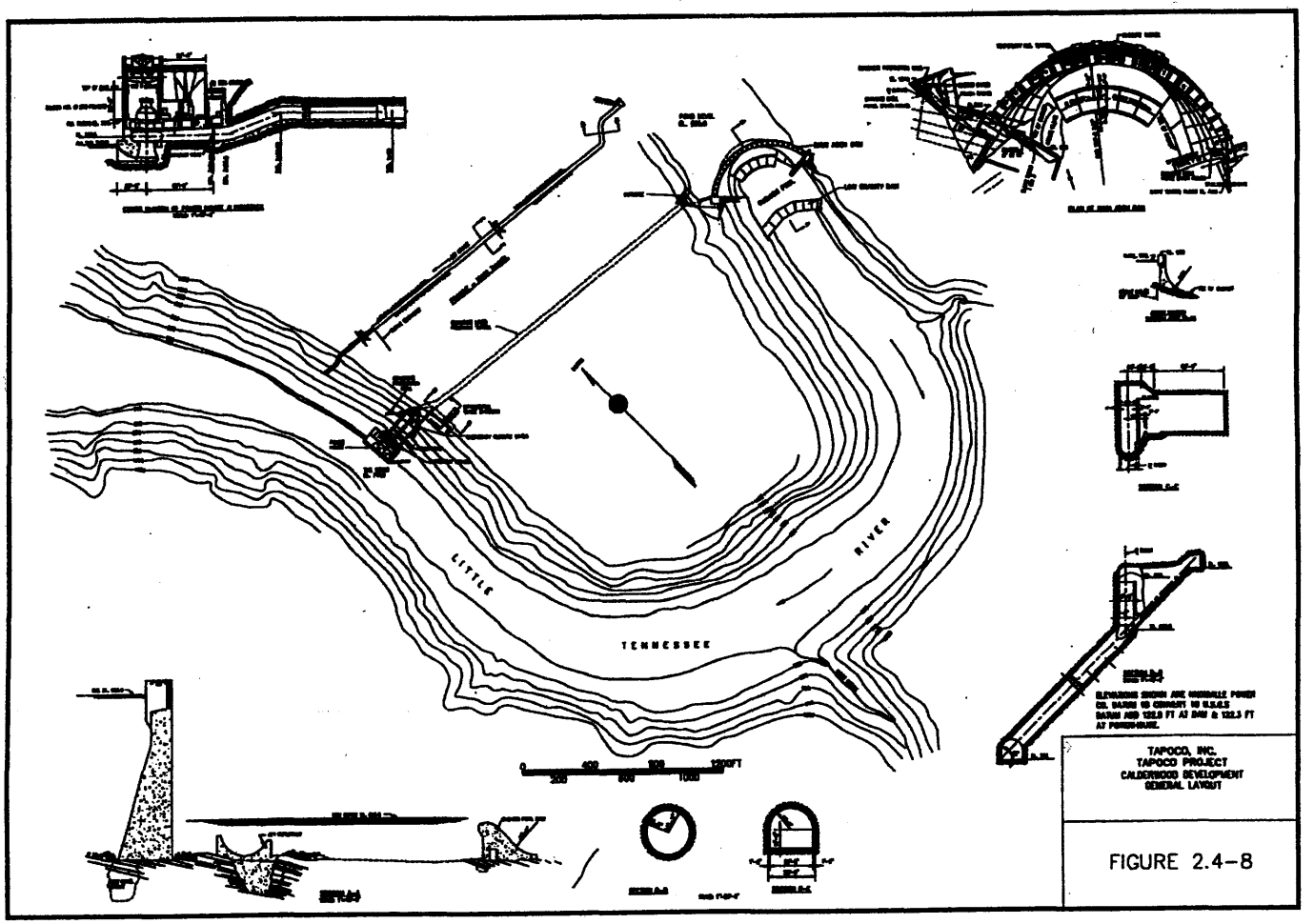


Figure No. 1. Plan of the Calderwood Dam and Powerhouse.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

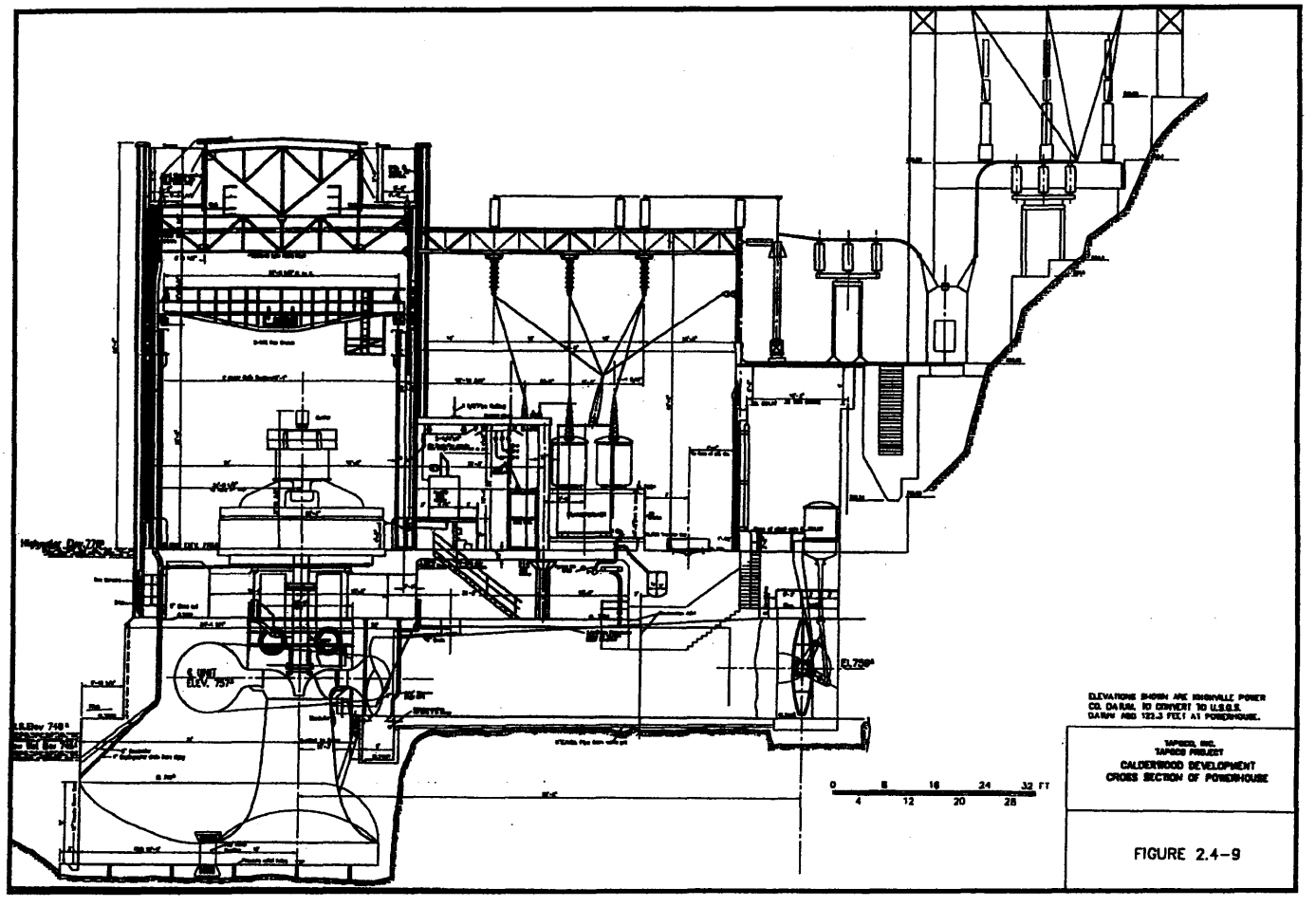
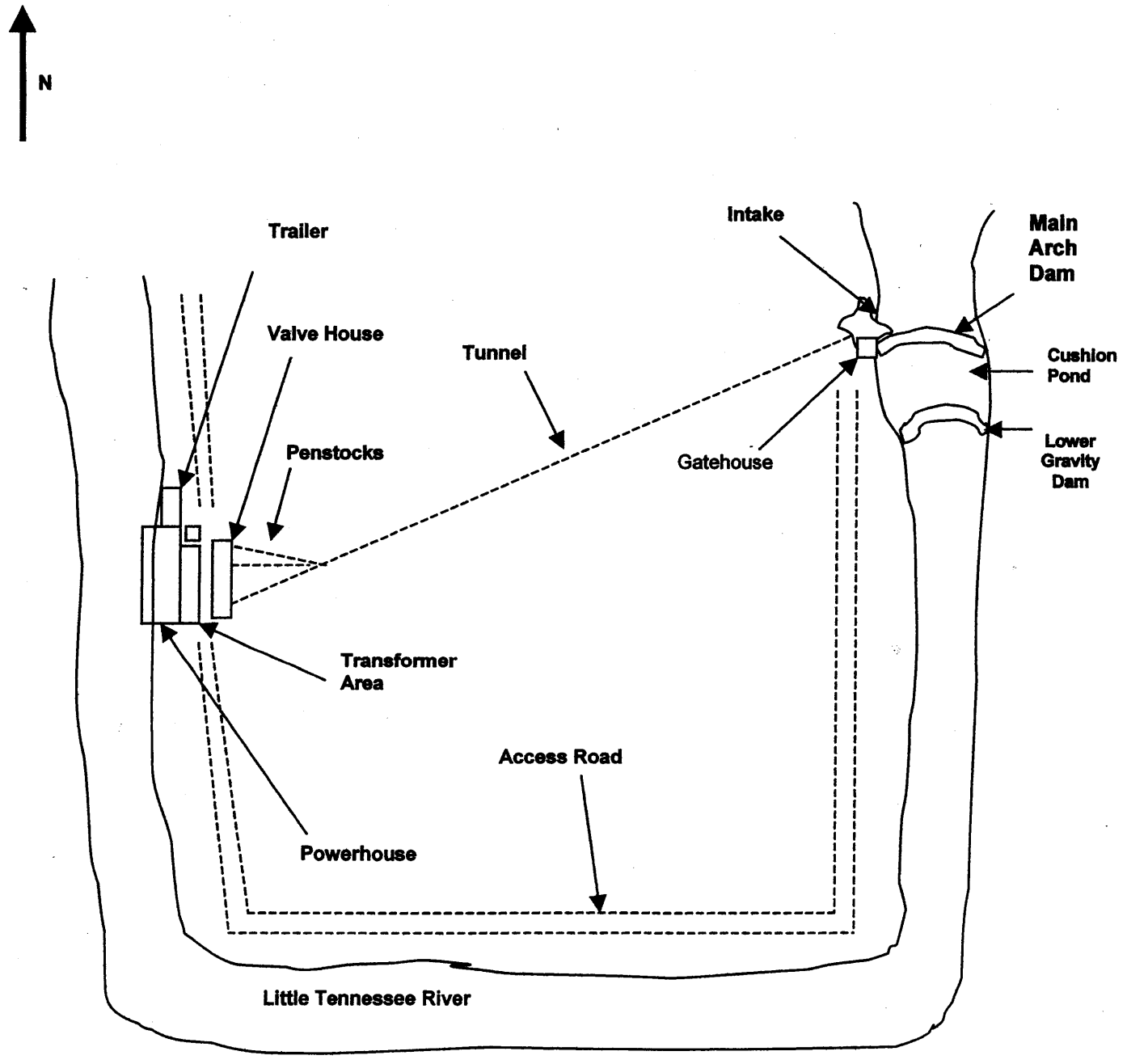


Figure No. 2. Cross-section of the Calderwood Powerhouse.



Map No. 1. Site Plan for the Calderwood Hydroelectric Development. (not to scale)

STATEMENT OF SIGNIFICANCE

SUMMARY STATEMENT

The Calderwood Hydroelectric Development meets National Register criteria A and C for its historical, architectural, and engineering significance. Under National Register criterion A, the Calderwood facility is significant in the industrial development of Tennessee. By the mid-20th century, Alcoa emerged as one of the leading manufacturers in the state, and the development of the Alcoa facility in Blount and Monroe counties made this region an industrial center. Alcoa employed thousands of workers in its aluminum plants, and its hydroelectric facilities made this production possible. Under criterion A, the Calderwood Hydroelectric Development is also significant for its role in military history. During World War II, the increased reliance on air power to fight the axis powers required enormous amounts of aluminum for aircraft production and other war materials. The power supplied by Calderwood was integral with this significant role played by Alcoa.

The Calderwood Hydroelectric Development is also significant under criterion C for its engineering and architectural design. The Calderwood Powerhouse is a notable example of a Colonial Revival style industrial building. The Calderwood Dam is notable for its engineering significance. Its unique design is well suited to its site, which has steep rock walls that make side spillways impractical. Flood waters spill freely over the crest without contact with the dam. The design also includes a 40-foot high auxiliary dam approximately 300 feet below the main structure. Inspired by natural waterfalls, this arrangement creates a deep pool to still the water and absorb its energy without damaging the dam or the river bed. Water strikes a U-shaped deflector at the bottom of the pool, which doubles its effective depth

The primary buildings and structures that comprise the Calderwood Hydroelectric Development are also notable for the retention of their historic and architectural character. The dam possesses its original poured concrete exterior surface, along with ancillary structures such as gatehouses and gantry cranes. The powerhouse retains original windows, decorative detailing, and interior floor plan and layout, and its character remains intact.

In addition to the primary buildings and structures, the Calderwood Hydroelectric Development maintains its sense of time and place as a planned early- to mid-century hydroelectric development. The mountainous landscape looks much as it did when the facility was completed, and there is no substantial residential or commercial development in the vicinity of the dam and powerhouse, or along the reservoir shoreline. The intact hydroelectric facility retains its historical integrity and reflects the industrial growth of a major American industry. The Calderwood Hydroelectric Development meets the registration requirements set forth in the Multiple Property Documentation Form, "Historic Resources of the Tapoco Hydroelectric Project."

HISTORICAL BACKGROUND

The Calderwood Hydroelectric Development is part of the Tapoco Hydroelectric Project of western North Carolina and eastern Tennessee. Tapoco is a division of Alcoa Power Generating, Inc. (APGI). APGI is a subsidiary of Alcoa Inc., which is one of the foremost aluminum manufacturers. Charles Martin Hall founded the company in 1888 as The Pittsburgh Reduction Company, and by 1890, the company was producing around 475 pounds of aluminum per day. The company experienced rapid success and growth in the late 19th and early 20th centuries as markets for aluminum increased dramatically.[2] The metal was used for a variety of products including kitchen utensils, medical and surgical instruments, foils, bottle caps, military implements, wire baskets and brushes, automobiles, and eventually airplanes. Early in its history, Alcoa implemented a strategy of vertical integration and self-sufficiency, which included a policy of expanding its manufacturing facilities and taking greater control of the raw materials and energy its product required. Aluminum production requires the raw materials alumina, cryolite, and carbon, as well as vast amounts of

[2]Charles Carr, *Alcoa: An American Enterprise* (New York: Rinehart & Company, Inc., 1952), 24, 42-43; 125.

electricity. Rather than purchase these materials, the company saw that it was in their best interest to produce them. Control of these basic ingredients enabled the company to prevent inflated costs and lessen potential technical problems.[3]

The process of making aluminum required extraordinary amounts of electrical power, and so the company sought out the least expensive methods for its production. The search for inexpensive electricity led the company to hydroelectric power, and it became actively engaged in developing its own hydroelectric sites and building and managing its own power plants. It also became important for the company to locate its aluminum reduction facilities near sources of hydroelectric power. In 1907, the company changed its name to the Aluminum Company of America, or Alcoa, to reflect its role as the industry leader. In 1909, the company focused on the Little Tennessee River and its tributaries in the Great Smoky Mountain region of Tennessee and North Carolina. The area proved to have a large number of favorable dam sites, and the company pursued the location for construction of hydroelectric systems.[4]

In 1913, the company purchased 664 acres north of Maryville, Tennessee, to build an aluminum reduction and fabricating plant. Construction of the plant began in the fall of 1913, and operations began at the new plant, the largest of its kind in the country, on March 6, 1914.[5] While the new plant was busy producing aluminum, the company's engineers were busy with the design and construction of its own dams and power stations along the Little Tennessee and its tributaries. These hydroelectric developments include Cheoah, Santeetlah (North Carolina), Calderwood, and Chilhowee. The falling water from the dams flows through the penstocks and into the turbines to create electricity. The power then traveled from the powerhouses to the reduction works at Alcoa, Tennessee. Alcoa later formed a subsidiary division of the company to manage its hydroelectric facilities. Named Tapoco, the division reflected the name of the original power company of the region, the Tallassee Power Company.[6]

The general layout of Alcoa's Little Tennessee dam system was finalized in late 1915. The first Alcoa dam and powerhouse to be constructed in the Little Tennessee area was Cheoah in North Carolina, which was completed in April 1919. The North Carolina Santeetlah facility was completed in 1928. Construction of the Calderwood facility actually began in 1918, while work was still underway on the Cheoah project and well before work began at the Santeetlah site. Work on Calderwood, however, was suspended as World War I was drawing to a close. Preliminary drillings in the area called into question the condition of the dam site, and the end of the war lessened an immediate demand for aluminum production. As time went on and the demand for aluminum increased, the Santeetlah site became the preferred location for the next dam.[7]

Later studies proved the Calderwood site to be acceptable, and work resumed on this project in July of 1927. The Calderwood Dam and Powerhouse were completed in April of 1930. This facility has a 232-foot high dam and a 121,500 KW capacity powerhouse. The dam is a constant angle arch with heavy abutments. Downstream from the main dam is a forty-foot high ogee spillway dam, which forms a cushion pool for water passing over the crest of the main dam. The system has twenty-four Stony type sluice gates that are each twenty-five feet in length and twenty feet in height. Two gantry cranes handle the gates.

---

[3]Ibid., 94-95.

[4]"History Power Developments on Little Tennessee River, 1909-1947," n.p., copy on file at Alcoa archives.

[5]Carr, 94.

[6]J. Elmer Housley, "Brief History of Tapoco and The Great Smoky Country" (Tapoco, NC: Tapoco Lodge, 1957), 1.

[7]"History Power Developments on Little Tennessee River," n.p.

The Calderwood Powerhouse is situated at the base of a steep rocky hillside. The location required a large V-shaped concrete barrier to be constructed behind the powerhouse to deflect potentially damaging rolling or sliding debris. Engineers also took advantage of the location to form a differential surge tank in the interior of the steep rocky hillside.[8] In addition to the dam and powerhouse, Alcoa also built a one-story brick, office building. This building was completed in 1930, and continues to serve as offices and a maintenance and repair center for the Calderwood facility.

For almost fifty years, Calderwood was the site of a company village with almost two dozen residences built on the ridge to the northeast of the powerhouse and office. This village consisted of identical plan, one-story frame dwellings along with shared frame garages. After World War II, Calderwood was enhanced through the construction of a one-story, brick school building in 1950. Adjacent to the school, a metal Quonset Hut built to house a movie theater was also constructed the same year. Also within the village a Methodist Church was constructed in 1954, and a concrete and brick Baptist Church was built in 1955. Calderwood remained a busy company village until the need for workers on-site lessened and the dwellings were gradually vacated. Over time all of the dwellings were razed, and only two garage buildings remain in the village area. The Methodist Church and adjacent cemetery remain in use by nearby residents, but the Baptist Church is now abandoned and in poor condition. Both the school and theater building remain extant, and are used for storage.

The Calderwood Hydroelectric Development, however, continued to play an important role in the region's industrial development. The Tapoco hydroelectric developments were the most substantial such systems in the country and brought previously unavailable power to the region, thus encouraging industrial development. Overall, industry throughout Tennessee increased approximately 45 percent between 1904 and 1909, and surged again in the 1920s. The number of wage earners in manufacturing increased 179 percent from 1899 to 1929.[9]

In addition to industry, the Calderwood Hydroelectric Development was an important part of the United States World War II effort. As one of the major suppliers of aluminum during World War II, Alcoa played a major role in America's victory over the axis powers. In the late 1930s in reaction to the mounting developments in Europe, Alcoa increased its production capacity in hard alloy sheet, forgings, and extrusions. After the invasion of Poland, demand for smelting capacity increased. The United States Military Aircraft Program fueled the need for sheet metal, and in October of 1940, the company began construction of a large sheet mill at Alcoa. This mill was designed to have a monthly capacity of five-million pounds. When it was completed in 1942, this facility, known as the North Plant, was one of the largest industrial buildings ever constructed in the mid-20th century.

Overall, wartime needs increased aluminum production in America by 500 percent, and aluminum was used for submarines, Quonset Huts, and other products. Aluminum's most significant use was in aircraft production. The possibilities of the defensive and offensive capabilities of air power were limited during World War I. However, with the outbreak of hostilities in 1939, air power played a dominant role in the victory of the Allies. Aircraft carriers quickly became the most important surface ships on the ocean surpassing

---

[8]Carr, 95-96; 106; "History Power Developments on Little Tennessee River," n.p.

[9]Robert E. Corlew, *Tennessee: A Short History*, 2d ed., (Knoxville: University of Tennessee Press, 1981), 517.

battleships. Attack aircraft launched from carriers led to major victories for America and its allies. The air campaign of the US Army Air Force and the Royal Air Force greatly disrupted Germany's industrial production, and diverted valuable resources away from offensive weapons to air defense. These achievements were gained above all by the "Allies' enormous industrial capacity which was the foundation of their air power."[10] By the beginning of 1945, Allied aircraft outnumbered their opponents by at least five to one.

The Calderwood Hydroelectric Development generated electricity to power Alcoa's plants during wartime. As the primary producer of aluminum sheet metal, Alcoa played a major role in the manufacture of aircraft and other wartime products necessary for the victory of the allies in World War II.

Alcoa continued to lead the aluminum industry in the post World War II years as it developed new uses for aluminum. Today, Alcoa continues to be a leader in the aluminum industry and operates numerous concerns nationwide. The Calderwood Hydroelectric Development remains an integral part of the Tapoco Hydroelectric Project in Tennessee and North Carolina, and continues to fuel Alcoa's major regional plants and work in conjunction with the Tennessee Valley Authority. Alcoa continues to be America's largest manufacturer of aluminum, and its operations in Blount County, Tennessee, employ over 2,000 workers.

Additional information is located in the accompanying Multiple Property Documentation Form, "Historic Resources of the Tapoco Hydroelectric Project."

[10] I.C.B. Dear, ed. *The Oxford Companion to World War II*, (New York, Oxford University Press, 1995), 22.

BIBLIOGRAPHY

Aluminum Company of America (Alcoa), Alabama Power Company, Tennessee Valley Authority, and the United States Army Corps of Engineers. "Alcoa's Hydroelectric Developments in the Smoky Mountains." Pamphlet prepared in conjunction with the Sixth International Congress on Large Dams, New York City, 1958.

Australian Cooperative Research Centre for Renewable Energy, Ltd. (ACRE). *Hydro-electric Power.* Perth, Australia: ACRE, 1998.

"Badin Multiple Resource Nomination," National Register of Historic Places Inventory Nomination Form. North Carolina Department of Cultural Resources, Division of Archives and History, Raleigh, NC.

Bishir, Catherine W., Michael T. Southern, and Jennifer F. Martin. *A Guide to the Historic Architecture of Western North Carolina.* Chapel Hill: The University of North Carolina Press, 1999.

Brockington and Associates. "Cultural Resources Management Plan for the Walters Hydroelectric Project," 1995.

Brown, D. Clayton. *Electricity for Rural America: The Fight for the REA.* Westport, CT: Greenwood Press, 1941.

Burns, Inez. *History of Blount County.* Nashville, Tennessee: Benson Printing Company, 1957.

Carr, Charles C. *Alcoa: An American Enterprise.* New York: Rinehart & Co., Inc., 1952.

"The Cherokee One Feather," Vol. VII, No. 29, July 17, 1974.

Childs, Marquis. *The Farmer Takes a Hand: The Electric Power Revolution in Rural America.* Garden City, NY: Doubleday & Company, Inc., 1952.

Danbom, David B. *The Resisted Revolution: Urban America and the Industrialization of Agriculture, 1900-1930.* Ames: The Iowa State University Press, 1979.

DuBoff, Richard B. "The Introduction of Electric Power in American Manufacturing." *Economic History Review, New Series* Vol. 20, No. 3 (December 1967): 509-518.

The Duke Power Company. Duke Power Archives, Franklin, NC.

Devine, Jr., Warren D. "From Shafts to Wires: Historical Perspective on Electrification." *Journal of Economic History* Vol. 43, No. 2 (June, 1983): 347-372.

"Electric Power." Manuscript on file at the Franklin Office of Duke Power, Franklin, North Carolina, n.d.

Engineering News-Record, February 26, 1942.

Hay, Duncan. *Hydroelectric Development in the United States, 1880-1940.* vol. 1. Washington: Edison Electric Institute, 1991.

History of Nantahala Power & Light Company. Duke Power Archives, Franklin, NC.

Hobday, Victor C. *Sparks at the Grassroots: Municipal Distribution of TVA Electricity in Tennessee.* Knoxville: University of Tennessee Press, 1969.

Hollingsworth, Mary. *Architecture of the 20th Century*. London: Grange Books, 1995.

Idol, Bruce S. and Mark S. Becker. "Final Report Phase I Archaeological Reconnaissance of 2,945 Acres (1,193 Hectares) in the Flat Creek Drainage, Fort Bragg, Hoke County, North Carolina." TRC Garrow, Durham, 2001.

Jackson, Donald C. *Great American Bridges and Dams*. Washington: Preservation Press, 1988.

Jellison, Katherine. *Entitled to Power: Farm Women and Technology, 1913-1963*. Chapel Hill & London: The University of North Carolina Press, 1993.

Lee, William S. *Duke Power Company, The Roots that Nourish the Future*. Princeton: Princeton University Press, Newcomen Society of the United States, 1987.

Mattson, Alexander, and Associates. "Historic Architectural Resources Survey Report," 1999.

Maynor, Joe. *Duke Power: The First Seventy-five Years*. Albany, NY: Delmar, 1980.

McRae, Barbara. *The Heritage of Macon County, North Carolina*. Winston-Salem, NC: Hunter Publishing Company, 1987.

_____. The Development of the Thorpe Project. Remarks for Sylva speech group. November 23, 1992. Nantahala Power & Ligh., Franklin, NC.

_____. *The Dillsboro and Sylva Electric Light Company*. Franklin, NC: Nantahala Power & Light Company, n.d.

Mills, Russell and Arun N. Toke with Susan Mills. *Energy, Economics, and the Environment*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1985.

"Multiple Resources of Blount County, Tennessee." National Register of Historic Places Multiple Property Nomination Form, 1989. On file at the Tennessee Historical Commission, Nashville, TN.

Nantahala Power and Light Company. *Nantahala Power and Light Company*. Franklin, NC, 1952.

Norwood, Gus. *Gift of the Rivers, Power for the People of the Southeast: A History of the Southeastern Power Administration*. Washington: United States Government Printing Office, 1990.

Nye, David E. *Electrifying America: Social Meanings of a New Technology, 1880-1940*. Cambridge & London: The MIT Press, 1991.

Riley, Jack. *Carolina Power & Light Company*. Raleigh, NC: Jack Riley, 1958.

Robinson, Blackwell P., ed. *The North Carolina Guide*. Chapel Hill: University of North Carolina Press, 1955.

Rushmore, David B. and Eric A. Lof. *Hydro-Electric Power Stations*. London: John Wiley & Sons, Inc., 1923.

Saloutos, Theodore. *The American Farmer and the New Deal*. Ames: The Iowa State University Press, 1982.

Saville, Thorndike. *The Water-Power Situation in North Carolina*. Chapel Hill: Circular No. 2, North Carolina Geological and Economic Survey, Water Resources Division, 32d Report, North Carolina Department of Labor and Printing, 1922.

_____. *The Power Situation in North Carolina.* Chapel Hill: Circular No. 10, North Carolina Geological and Economic Survey, Water Resources Division, 32d Report, North Carolina Department of Labor and Printing, 1924.

Smith, George David. *From Monopoly to Competition: The Transformations of Alcoa, 1888-1986.* New York: Cambridge University Press, 1986.

Thorpe, J.E.S. *History of Nantahala Power & Light Company.* n.p., 1939.

Tilley, Nannie May. *The Bright-Tobacco Industry 1860-1929.* Chapel Hill: University of North Carolina Press, 1948.

United States Department of Energy. *Hydroelectric Power: Turning Water's Mechanical Energy into Electricity.* Golden, CO: National Renewable Energy Laboratory, 1998.

Whitaker, Mac. Interview by Fred Alexander, October 1983. Nantahala Power & Light Company, Franklin, NC.

Wolfe, Audra J. "How Not to Electrocute the Farmer: Assessing Attitudes Towards Electrification on American Farms, 1920-1940." *Agricultural History* 74 (Spring 2000): 515.

Woolf, Arthur G. "Energy and Technology in American Manufacturing: 1900-1929." *Journal of Economic History* Vol. 42, No. 1 The Tasks of Economic History (March, 1982): 230-232.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

VERBAL BOUNDARY DESCRIPTION

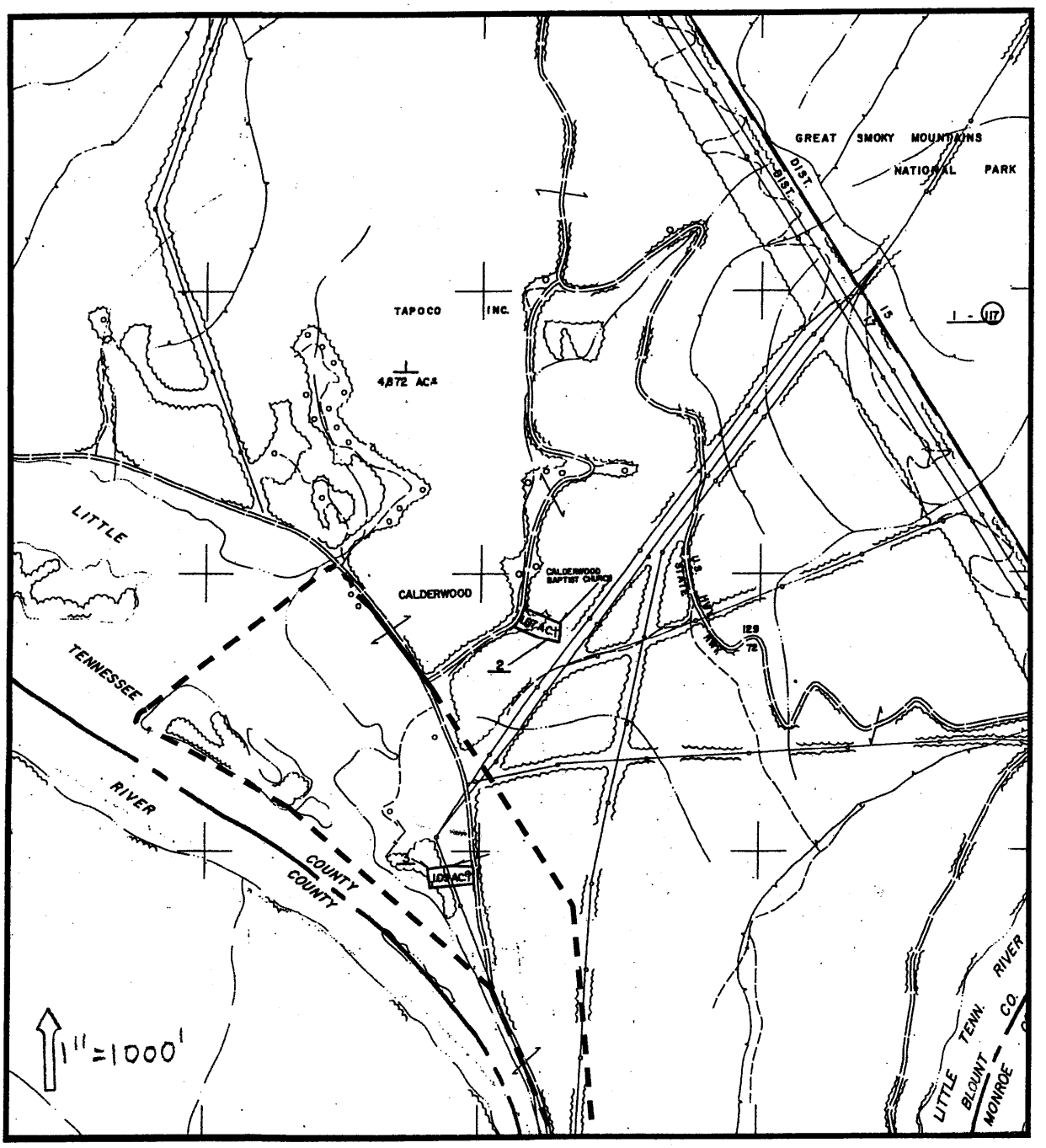
The boundary for the Calderwood Hydroelectric Development is shown as the dotted line on the accompanying Blount and Monroe County, Tennessee tax maps. The boundary is illustrated on Blount County tax map 170 and Monroe County tax map 87 which are at a scale of 1" = 1,000' (reduced scale of 1" = 400'). The boundary includes approximately 195 acres, the majority of which are in Blount County. The property is bounded on the east by an imaginary line which is approximately 125' east of the eastern face of the Calderwood Dam and which extends north to intersect the Calderwood Access Road. The property is bounded on the south by an imaginary line, which is approximately 250' south of the southern face of the Calderwood Dam, and this boundary then connects and follows the Blount County line and the shore line of the Little Tennessee River. The western boundary also follows the Blount County line and the shore line of the Little Tennessee River. The northern boundary of the property extends from the Blount County line northeast to the intersection with the Calderwood Access Road.

VERBAL BOUNDARY JUSTIFICATION

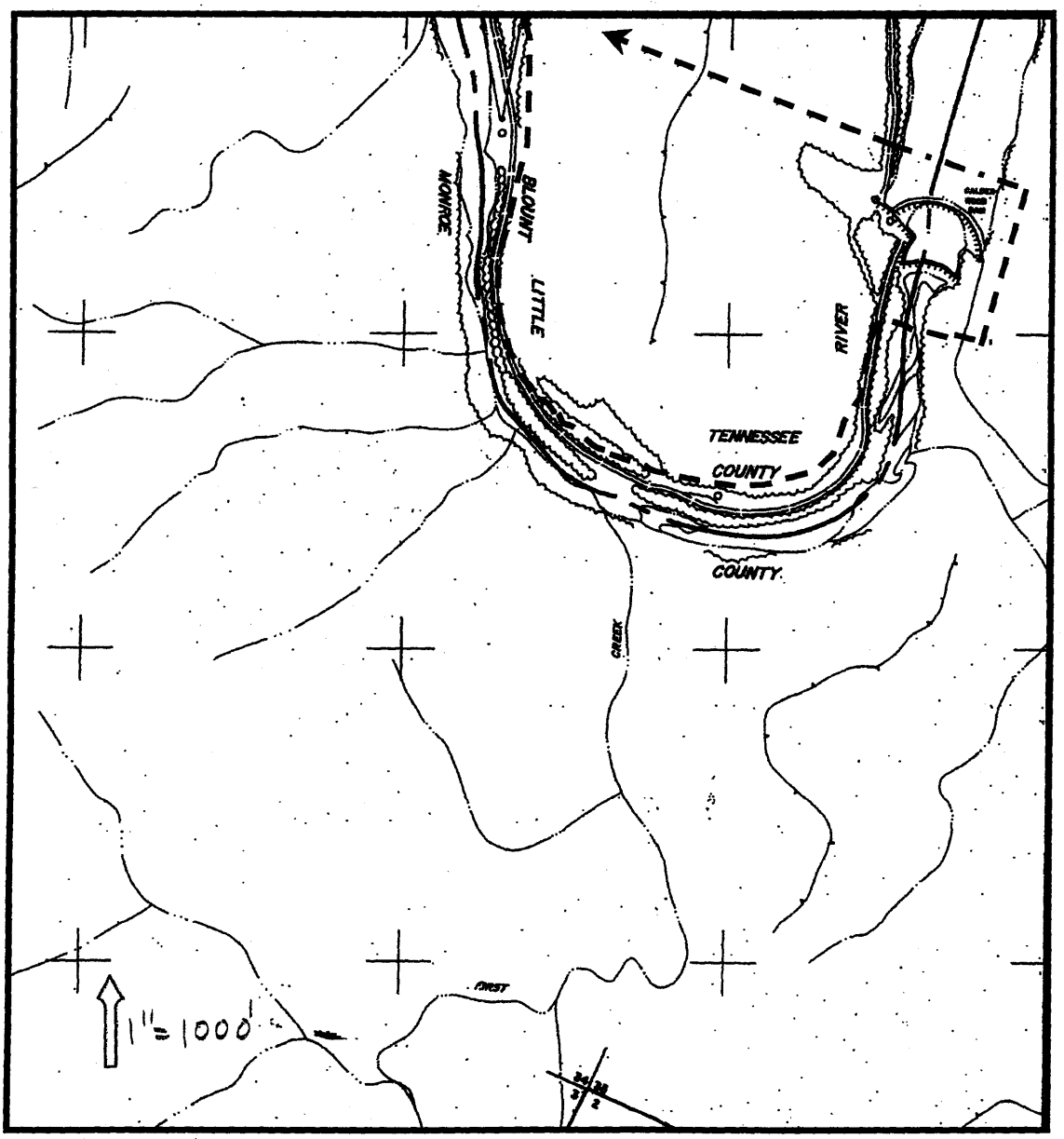
The boundary for the Calderwood Hydroelectric Development includes the dam, powerhouse, tunnel, service buildings, and other support buildings and structures historically associated with the facility's construction and operation. The boundary is drawn to exclude the post-1960 buildings and structures located to the north of the Calderwood service area. This area originally contained worker's housing for the Calderwood development but all of these dwellings have been razed. Two churches built in the 1950s associated with the housing area are outside of the boundary and do not possess notable architectural or historical significance. No other properties associated with the Calderwood hydroelectric development remain extant.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet



Recommended National Register Boundary for the Calderwood Hydroelectric Development (Tax Map #170 for Blount County, Tennessee).



Recommended National Register Boundary for the Calderwood Hydroelectric Development (Tax Map #87 for Monroe County, Tennessee).

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Calderwood Hydroelectric Development
Blount County, Tennessee
Monroe County, Tennessee
Photo by: Thomason and Associates
Date: September-December, 2001
Location of Negatives: Tennessee Historical Commission

Photo No. 1 of 13: Calderwood Dam, view to the south.

Photo No. 2 of 13: Calderwood Dam, view to the northeast.

Photo No. 3 of 13: Calderwood Dam, Gatehouse, and Gantry Crane, view to the northwest.

Photo No. 4 of 13: Calderwood Powerhouse, west facade, view to the northeast.

Photo No. 5 of 13: Calderwood Powerhouse, south facade, view to the north.

Photo No. 6 of 13: Calderwood Powerhouse, interior view.

Photo No. 7 of 13: Calderwood Valve House, north and west facades, view to the south.

Photo No. 8 of 13: Calderwood Chlorination Building, view to the southwest.

Photo No. 9 of 13: Calderwood Service Building, east and north facades, view to the southwest.

Photo No. 10 of 13: Calderwood Service Building, detail of main entrance.

Photo No. 11 of 13: Calderwood Theater, north and west facades, view to the southeast.

Photo No. 12 of 13: Calderwood School, north and east facades, view to the southwest.

Photo No. 13 of 13: Shed, view to the southeast.