A Report Prepared for:

Environmental Planning Division
Tennessee Department of Transportation

Inspection and Historical Documentation
of the Earnest Mill Site,
Nolichucky River, State Route 351,
Greene County, Tennessee

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Introduction

In response to a solicitation by the Environmental Planning Office, Tennessee Department of Transportation (TDOT), the author inspected the visible remains of the Earnest Mill Site adjacent to the Nolichucky River Bridge on SR 351 in Greene County, Tennessee. Site-specific historical documentation of the mill seat was also conducted. The purpose of the inspection and documentary research was to provide data pertinent to a determination of the potential for significant archaeological remains associated with a grist and flour mill site threatened by a TDOT bridge replacement project then in the planning stage.

TDOT environmental planning reports on the bridge replacement project by Law (1991) and Carver (1991) provided some data on the Earnest Mill Site, but the mill was not the subject of a detailed historical treatment at this preliminary planning stage. The author was authorized on July 31 to conduct an inspection of the site, and was subsequently authorized on August 17 to conduct site-specific archival research on the mill. Inspection of the mill site near Chuckey took place on August 12, and primary historical data on the mill was collected in Greeneville on August 24 and 25.

Site Inspection

On August 12, 1992, the author met with project planner Ms. Zada Law at the Earnest Bridge and inspected the visible remains of the mill. The current owners of the property, Mr. and Mrs. Uriah M. Clemmer, also provided anecdotal information about the mill. The Earnest Mill Site is on the right bank of the Nolichucky River at about mile 66.75.

After light clearing of the brush on the eastern margin of the bridge, two distinct limestone foundation elements were visible. The apparent northeast corner of the mill house foundation was noted. The east wall disappeared within two or three meters into a spoil bank and brush, while the north wall could be traced intermittently to the west perhaps five meters, having incorporated into its length underlying natural limestone ledges. The exposure of the apparent south wall of the mill was less than two meters in length, terminating abruptly under the east dripline of the bridge. Both foundation elements were constructed of limestone identical to the underlying strata, and were approximately one meter (three feet) in width.

A linear pit feature noted near the southwest corner of the mill is probably a trackhoe cut associated with preconstruction clearing of the eastern margins of the current highway bridge and is probably not a wheel or turbine pit. Spoil from the cut along the east edge of the bridge was probably redeposited on the east side of the mill, obscuring any remains in
that area. The piers of the adjacent bridge are based on monolithic concrete slabs poured atop, and anchored to, the limestone terraces underlying the bank of the river.

Several metal objects were in association with the foundation elements of the mill, but none could be clearly identified as mill machinery. The bank of the Nolichucky River below (south of) the mill was viewed, but the elevated condition of the river due to recent rains did not permit a close inspection of the bank for tailrace features.

Remains of the mill dam were also viewed. The structure was built of poured concrete, and featured two apertures in its face. A metal pipe approximately 30cm in diameter penetrated the east end of the dam, and an overflow sluice gate perhaps one meter square was present in the west end. No measurements were made of the structure, but its height was about two meters above the stream bed on the downstream face. An angled abutment was present on the west end of the structure. A portion of the uppermost pour level of the dam had been dislodged during a flood event and had been displaced a dozen meters downstream.

The field inspection confirmed that physical remains of the Earnest Mill were present, and consisted of in situ portions of the limestone foundation of the mill house. Disturbance to the west side of the structure was also apparent. The scope of work did not require mapping of the foundations or photographic documentation of the same. The visible foundations of the mill were, however, photographed by Ms. Law.

**Historical Documentation**

Historical research on the Earnest Mill Site was site-specific and centered around construction of a chain of title on the land parcel subsuming the mill. The objectives of the chain of title research were to document ownership of the mill seat through time in order to provide essential references to relevant records such as census data. Other documents reviewed consisted of minutes of the Greene County Court, Estate Inventory Books, Administrators Settlements, and Wills. Secondary historical treatments of Greene County were also inspected. In addition to research performed at the Greene County Courthouse, the historical collections of the Greeneville Public Library were reviewed. Greene County historian T. Elmer Cox was contacted during the course of the research, and a brief visit to the Nathaniel Greene Museum of Greeneville and Greene County was made.

Relevant census records of manufacturing enterprises in Greene County in 1850, 1870, and 1880 were provided by TDOT. Anecdotal data on the mill was provided by the current owner of the property, Mr. Uriah Clemmer. The following narrative should not, however, be considered an exhaustive treatment of the Earnest Mill Site history.
Early Greene County inhabitant Henry Earnest is by tradition associated with the mill at the Earnest Bridge, although there is no documentation to support this assertion. Henry Earnest was granted two 600-acre tracts in the general vicinity in 1784, but both tracts were on the south bank of the Nolichucky River (Burgner 1981: 5, 13). Unlike the hilly terrain along the north or right bank of the river in the project vicinity, the lands on the south bank are gently rolling lands more suitable for farming.

Creation of a mill seat at the Earnest Mill Site appears to have been done during the tenure of John Morris. Spelled variously as Mauris, Moriss, Morriss, Morreas, and Maurice, John Morris was an early and prominent inhabitant in Greene County. Morris is listed frequently in the minutes of the Court of Common Pleas, having received a commission as a Justice of the Peace in February, 1794 (Burgner 1982: 162). References to Morris in the early minutes, however, overwhelmingly refer to activities associated with the county court (Burgner 1982; Houston 1981).

Morris received two 100-acre land grants from North Carolina for lands on the north bank of the Nolichucky, but both these tracts, (granted in 1784 and 1795) were inland from the river (Greene County Deed Book 1B: 31-32, 29-30). The mill tract on the river is apparently subsumed in a purchase Morris made on September 11, 1794. On this date, Morris paid Jacob Hise 150 pounds for a 50-acre parcel on the north bank of the river (Greene County Deed Book 2: 324-25). The recitation "... and all houses, buildings, mills and orchards, waters, water courses ..." may well be pro forma. This may have been the 50-acre parcel Hise was granted by North Carolina in January, 1793 (Burgner 1981: 153).

The county court had to give permission for the construction of mills, and the court minutes for the period 1783-1807 made no notation of Morris obtaining leave to construct a mill. The court minutes for 1783-1795, as copied in Burgner (1982) also contain no mention of Hise in this context.

Morris prepared a will on January 22, 1828, and in this document notes: "Fourth, It is my will and desire that my Mill with the appertainances [sic] thereto belonging, together with the original conveyance thereto belonging, supposed to [be] fifty acres of land, ... be sold." Neighbor Peter Earnest signed the will as witness (Greene County Will Book 1: 3). This is the earliest mention of a mill on the site so far uncovered.

John Morris died prior to, or during, 1839, and his executors assumed responsibility to sell the mill and its accompanying 50-acre tract. On February 27, 1846, executors Charles Bright and Abraham Fellers conveyed a 150-acre tract subsuming the mill property to Peter Earnest. The deed recounted that Morris had last lived on the parcel, but made no specific mention of a mill (Greene County Deed Book 22: 77-79). It is highly likely, however, that Peter Earnest would have resumed use of the mill, or built a
new one, as a natural subsidiary enterprise of his farming operation on the south bank of the river.

The 1850 Census Copies of the microfilmed enumerator's worksheets of Schedule 5, Products of Industry, Seventh Census of the U. S. (1850), were provided by TDOT. Only three pages of Greene County worksheets were copied, documenting eight water-powered grist and/or saw mills in Greene County. This is not a complete set of schedules, and the Earnest Mill does not appear in the districts covered.

The Earnest family was prominent in this area of the county, and the Earnestville community was the progenitor of the town of Chuckey. The family played a key role in the construction of a toll bridge across the Nolichucky near the mill seat on Rheatown Creek in the late 1850s. This bridge would have greatly enhanced the commercial potential of the mill by improving access to the facility. The Earnestville Bridge Company was organized in 1856 and Peter Earnest was elected its president. Son B. F. Earnest was secretary. This bridge was later covered to improve its safety for wagon teams (Chuckey Ruritan Club).

Peter Earnest prepared a will on May 27, 1856, with this provision: "Thirdly, I give and bequeath to my son Joseph H. Earnest my mills and the plantation that they stand on that I consider worth four thousand dollars also the houses and lots that I have given him heretofore which I consider worth one thousand dollars over and above his outfit." Another son, Benjamin Franklin Earnest, was to inherit the plantation on which Peter was residing at the time, this being the farming tract south of the Nolichucky (Greene County Will Book 1: 563). The will was filed for probate on March 4, 1862, shortly after Peter Earnest's death.

On October 20, 1862, Joseph H. Earnest conveyed to his brother Benjamin F. Earnest the 150-acre mill tract his father Peter had purchased from the Morris estate in 1846 (Greene County Deed Book 33: 207-08). The conveyance makes no mention of the mill or mills, and no plat is cited. The Earnestville Bridge built in 1856 had evidently been lost by the late 1860s. In 1869, the company again petitioned the Greene County Court for permission to erect a toll bridge and also received permission to operate a ferry at the crossing until construction was completed. In the petition the incorporation is referred to as the Third Earnestville Bridge Company, referring to a third group of investors as opposed to a third bridge (Greene County Minute Book 25: 170-71).

The 1870 Census Copies of the microfilmed enumerator's worksheets of Schedule 4, Products of Industry, Ninth Census of the U. S. (1870), were provided by TDOT. Documented on these sheets are 49 grist or flour mills, saw mills, and wool carding mills, all but one being water powered. Benjamin Earnest is listed as the owner of a flouring and saw mill powered by water. Interestingly, the enumerator of this district noted that the
overshot wheel powering the mill was 25 feet in diameter and 4 feet wide (U.S. Census 1870). Flour or grist mills operated in conjunction with a saw mill were not uncommon in the census, but in no instance were separate power supplies recorded; the milling and sawing equipment shared one motive power source.

The 1880 Census Copies of the microfilmed enumerator's worksheets of Special Schedules 7 and 8, Flour and Grist Mills, Cheese, Butter, and Condensed Milk Factories, Tenth Census of the U.S. (1880), were provided, documenting 37 mills. All but two of the mills were powered by water, and the overshot water wheel was by far the most common source of power. Of 35 water-powered grist mills, 25 were powered solely by the overshot, one by undershot, two by breast, five by turbines, one was unspecified, and one mill used both a turbine and an overshot wheel.

B. F. Earnest's overshot waterwheel was powered by a fall of 27 feet, and the wheel, probably 24 or 25 feet in diameter, was 2 1/2' wide, turned 5 rpm, producing 20 horsepower. The wheel turned two runs of stone, one evidently producing corn meal and the other flour [two types of stones were used]. The mill operated full time only four months out of the year, and half of the mill's output was custom, that is, the miller ground meal and flour on a toll basis as a service to local farmers. The other half of the mill output was for retail sale. It is unclear whether or not the saw mill documented in the 1870 census was still associated with the Earnest Mill in 1880; the relevant saw milling schedules have not been examined.

Benjamin Franklin Earnest evidently recited a will on his deathbed. The document, dated September 30, 1887, left all his holdings to his wife Macy, for her use and the support and education of their children (Greene County Will Book 2: 229). Following Mary M. Earnest's death, the division of the estate proceeded between Nicholas P. Earnest, Samuel Rhea Earnest, and Eleanor L. Earnest. Holdings on the north bank of the Nolichucky were granted to S. R. Earnest in 1896, including a 289-acre parcel that evidently subsumed the mill tract (Greene County Deed Book 63: 501-03). S. R. Earnest conveyed 48 acres of this tract to brother N. P. Earnest in 1898, and a 150-acre portion of the same in 1900, also to his brother (Greene County Deed Book 77: 485-86; 486-88). However, the mill tract proper was conveyed by S. R. Earnest to N. P. Earnest in a deed of June 9, 1900. The conveyance of four acres specifically recites the presence of the mill (Greene County Deed Book 70: 69-70). S. R. Earnest was described as a resident of Russell County, Colorado, in one of the deeds.

The second bridge at Earnestville was washed out in a flood in May, 1901. The American Bridge Company of New York constructed a new bridge in the same location as the 1869 structure. By raising the old shore abutments five feet, and constructing a new central pier of recycled stone, a new bridge was opened in 1902 (Chuckey Ruritan Club).
A review of the 1939 edition of the Chuckey 7.5 minute USGS-TVA Quadrangle Map, (105 NW) depicted the mill dam on Rheatown Creek, an apparent flume extending 700', and the mill house on the north (right) bank of the Nolichucky River at about mile 66.75. The flume followed a course SSE to the mill, and passed on the east side of the structure. At the dam site, the thread of Rheatown Creek passed parallel to, and west of, the flume, entering the river just east of the 1902 bridge (USGS-TVA 1939).

The Earnest Mill is supposed to have been operated as late as 1948, on the basis of anecdotal information (Chuckey Ruritan Club). Nicholas Peter Earnest died intestate in 1956, and his holdings on both banks of the river were divided between his children. After a division among the heirs, the mill tract, as well as other lands on the south bank, was conveyed to Claudius G. and Katherine E. Clemmer in 1958 (Greene County Deed Book 204: 527-29). The current owners are Mr. and Mrs. Uriah M. Clemmer.

In 1967, the 1902 bridge on State Road 351 collapsed under the weight of a piece of heavy machinery, killing the driver of the vehicle. The Earnest Mill was demolished in 1967 as construction of the present bridge began (Chuckey Ruritan Club). The new bridge, completed in 1969, had been erected approximately 100' upstream from the former location, and bridge right-of-way impinged on the margins of the mill house. The latest edition of the Chuckey quad map, dated 1971, depicts the currently-standing bridge and indicates that the east dripline of the bridge would have been superimposed over the west side of the mill house (USGS-TVA 1971).

**Evaluation of the Earnest Mill Site**

Field inspection of the Earnest Mill Site confirmed that physical remains of the mill house were present, namely portions of the limestone foundations. Disturbance to the west side of the mill was demonstrable, but the eastern half -- where the waterwheel would have been mounted -- was obscured by dense vegetation and spoil dirt. To probe the research potential of this mill site, a brief site-specific documentary history was prepared.

The present documentary data, although not exhaustive in coverage, indicates that the mill seat had been established by 1828 and was operated by John Morris, a Greene County Justice of the Peace. The next clear reference to the site -- Peter Earnest's 1856 will -- refers to mills, probably indicating that a saw mill was being operated in addition to the grist/flour mill. Benjamin Franklin Earnest continued the operation of the mills to at least 1870, and the saw and grist milling apparatuses were being run by one overshot water wheel. The grist and flour milling was still taking place in 1880, although the overshot wheel powering the operation appears to have been rebuilt in the interim. Nicholas Peter Earnest acquired the mill in 1900, and is said to have operated it until 1948. While the overshot wheel may
have been standing until the demolition of the mill in 1967, it is conceivable
that the mill was actually powered by a turbine installed after 1900, also the
probable date after which the concrete mill dam and iron pipe flume were
installed. The iron pipe supplying the Earnest Mill after 1900 (?) probably
replaced a timber-trestled open wooden flume.

Accounts of the structure describe the Earnest Mill as a three-story
frame mill house resting on a stone basement/foundation. With the razing of
the superstructure, the architectural significance of the mill, including the
arrangement of its milling equipment and power transmission equipment, is
difficult to assess. Apart from architectural considerations relating to
building techniques and/or materials, or historical associations of the mill to
significant persons or events, the chief research potential of mill sites relates
to the industrial technology used at the site with particular reference to
motive power. The overshot wheel, such as was clearly in use at the Earnest
Mill in 1870 and 1880, is one of the oldest types of hydraulic power
installations (see Reynolds 1983). Because of the simplicity of the
installation, and its low-volume water requirements, it is a extremely
widespread power device in well-watered areas with modest or high terrain
relief. The overshot wheel continued to be used long after the availability of
turbines because of their relative efficiency. Metal versions of this archaic
form of wheel were manufactured well into this century.

An overshot wheel, from an archaeological standpoint, has few
remains below grade. Metal components of the wheel proper, as well as any
iron gearing or power transmission equipment in the mill, are subject to
scraping and recycling. Apart from the structural foundation of the mill
house proper, only the remains of a pier to support one end of the wheel
axle might survive the razing of the frame superstructure. Other remains
might include a masonry-lined tailrace, the channel followed by water
discharged at the base of the wheel. The field inspection showed that much
of the stone foundation wall had been removed, particularly on the west side
of the mill adjacent to the bridge. The east side of the mill, where the wheel
was located, could not be observed due to spoil and vegetation.

The 1880 census data on manufactures is particularly detailed with
respect to mill technology, and allows an assessment of the relative
significance of one mill with respect to its contemporaries. None of the 1880
production statistics for the Earnest Mill, or the mill technology evidenced in
the census record, sets the Earnest Mill apart from others in Greene County.
The overwhelming use of overshot wheels in Greene County in 1880 is
identical to that in neighboring Washington County, where the topography is
similar (see Council 1984). Large farming operations, and many small farms,
operated grist and flour mills as an ancillary enterprise. Grist stones ground
corn into meal and produced livestock feed, while flouring stones ground
grains such as wheat and rye for human consumption. Any surpluses of
meal, feed, or flour could be sold on the retail market. Clearly, this is the case with B. F. Earnest's tenure as mill owner.

The current census and anecdotal information about the Earnest Mill suggest that the facility had only been equipped with an overshot wheel, and had not been converted to turbine or other motive power between 1880 and its razing circa 1967. However, county historian T. Elmer Cox was of the opinion that the wheel had been replaced with a turbine before 1900, and that grist and flouring stones had been replaced with a roller mill. While these changes are consistent with general trends in the milling industry in the 1880s and 1890s, no specific evidence for these conversions at the Earnest Mill was cited. Mr. Cox clearly had some knowledge of the site, however, noting that the mill house had been built atop a geological structure of shelf-like limestone. This was confirmed in the field inspection. Turbine installations at the Earnest Mill would either have been superstructural, in the form of timber penstocks, or would have to have been cut into the limestone strata underlying the mill. The presence of turbines at the Earnest Mill is a moot point.

With respect to the history of hydraulic power technology, late 19th century turbines are of less interest than turbines manufactured before 1880. There was considerable experimentation in turbine design before the emergence in the late 19th century of what is now identified as the American mixed-flow turbine of the type produced by James Leffel and others (see Hunter 1979). The recovery of a vintage 1900 turbine from the Earnest Mill Site, while of local interest, would not necessarily be a significant contribution to the history of hydraulic technology.

Motive power at the site in John Morris' tenure is unknown, but very likely was an overshot wheel. This is probably the case during Peter Earnest's ownership as well. Turbines, particularly during the antebellum period, were significant capital investments, and were often difficult to apply to grist mills due to the high shaft speeds generated by the turbines. The slow-turning overshot wheel produced very acceptable shaft speeds and did not require elaborate gear transmissions. On the other hand, the high shaft speeds of turbines were desirable at sawmills, particularly where circular saws were in use. Our one reference to a grist and saw mill combination at the Earnest Mill, in the 1870 census, refers only to one overshot wheel powering both mills.

In summary, the earliest reference to a mill on the site is 1828, under the tenure of John Morris. It is possible that the mill documented in the 1870 or 1880 census is this early structure, but it is also possible that the floods that destroyed the Earnest Bridges also wrecked the adjacent mills; the flood that demolished the 1856 bridge, for example, may have swept away the Morris/Peter Earnest Mill. The overshot wheel powering the grist and saw mills in 1870 was probably rebuilt by 1880. The concrete mill dam
now on site is not the original dam of the mill seat, probably having been rebuilt after 1890-1900. The iron pipe flume evidenced at the concrete dam is also a late modification and could have supplied water to an overshot wheel or to a turbine.

**Recommendations**

Phase II excavations at the Earnest Mill Site are feasible. The objective of this testing would be to determine if any early 20th-century turbines were installed in place of the overshot wheel and to search for early (pre 1870) power installations. A limited testing program, employing a backhoe for spoil movement, is still an option at this time. The east side of the mill house would be targeted for exploration and mapping.

It is, however, the opinion of the author that there is a low probability of encountering remains significant to an understanding of the evolution of hydraulic power installations. The topography of the mill site is not conducive to the preservation in place of early structures, namely hydraulic power installations associated with the Morris mill. Given the underlying hard limestone strata, hydraulic power installations would have probably perched above the local ground surface and been lost with the demolition of the mill.

A second option is to conduct monitoring during preliminary construction clearing at the site. Any mill machinery buried in the spoil banks around the mill could then be recovered and a determination made as to their disposition. The land owners, or local museums, may be disposed to obtain such items. Any in situ installations or machinery could be documented at this time.

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