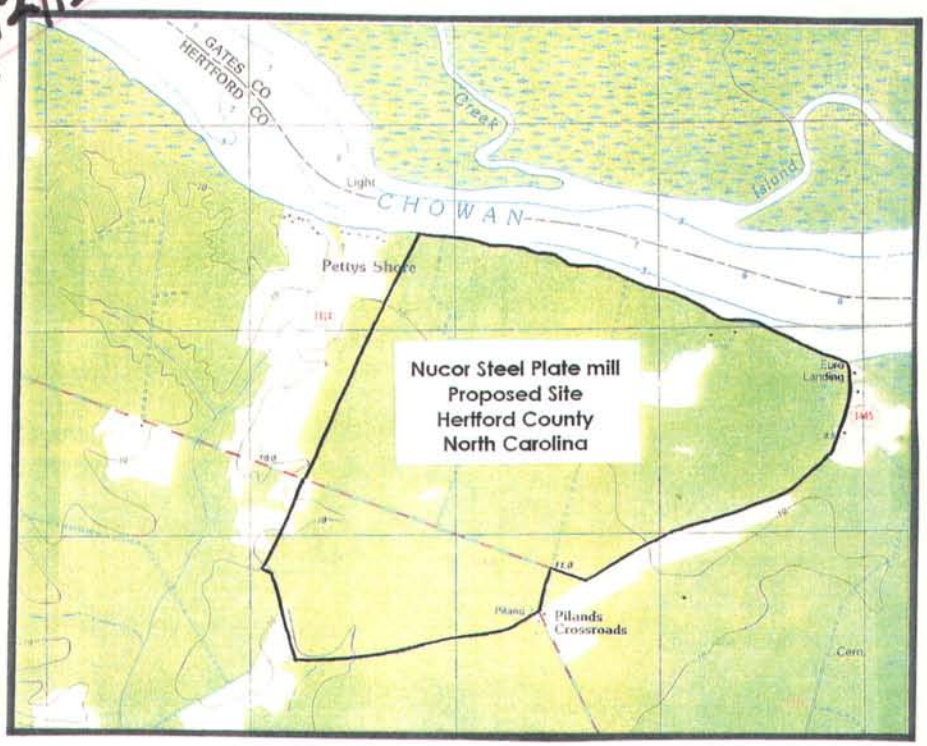
REPORT IN SUPPORT OF CONSTRUCTION AND OPERATION OF THE NUCOR STEEL PLATE MILL IN HERTFORD COUNTY, NORTH CAROLINA

DRAFT

Carmen Johnson 4/12/12
46-[redacted]

Revised: November 13, 1998



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November 12, 1998

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RE: Preliminary Draft Environmental Report
Nucor Steel Mill - Hertford County, NC

Dear Edith and David:

Enclosed you will find a copy of Nucor's Preliminary Draft Environmental Report in support of various permit applications associated with Nucor Steel's proposed Hertford County Steel Mini Mill. The Draft Report contains additional information in response to the constructive comments made by various State and Federal officials during the past several weeks. **This Draft Report is intended to foster further internal agency review and comment, but should not be considered as Nucor's final environmental report.**

On behalf of Nucor, we wish to emphasize Nucor's commitment to the environmental review process. We recognize that additional information may be needed in some areas, and that additional questions may need to be addressed. Thus, as noted above, the enclosed Draft Report should not be viewed as Nucor's final environmental documentation on all issues. In recognition of that fact, we would like to request that a working meeting be scheduled immediately with all available members of the DENR Permit Review Team. The purpose of this meeting will be to obtain additional feedback from the various regulatory and resource protection

divisions within DENR such that Nucor and its consultants will be able to further supplement the Draft Report in the near future.

With regard to Federal 404 and Section 10 permitting issues, Nucor's consultants will engage in additional discussions with you (David Lekson) and other appropriate Corps staff with the goal of laying additional groundwork for the December 9, 1998 interagency meeting to be held at 1:30 PM in the Corps' Wilmington, North Carolina offices. In this regard, Nucor very much desires to maximize all available opportunities for State-Federal coordination of the various permitting process with the goal of producing a single environmental report that will provide all information needed by various permitting officials and the public.

On behalf of Nucor, we look forward to working with each of you and your respective regulatory staffs to identify, address and resolve all environmental issues in a fair and expeditious manner. We shortly will contact each of you in order to identify the next appropriate steps in the permitting processes under your respective jurisdictions.

With best personal regards, we remain

Yours very truly,

Frank H. Sheffield, Jr.

I. Clark Wright, Jr.

ICW:icw
NBMAIN\Doc145.wpd
Enclosures
cc: DENR Permit Review Team
Mr. Henry Lancaster
Mr. Daniel McLawhorn
Dr. Wayne Wright
Ms. Brooke Lamson
Mr. Joe Rutkowski
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1. 0 INTRODUCTION

In response to previous discussions with the Wilmington District U.S. Army Corps of Engineers (USACE) and the North Carolina Department of Environment and Natural Resources (NCDENR), information on the date of market entry, site conditions at that date, criteria for the alternative site evaluations, and environmental concerns are presented in this report.

This document describes the project purpose, defines the geographic region of potential alternatives, and presents an evaluation of twenty-five sites. In compliance with Section 404 (b) (1) guidelines, alternative sites were examined to identify the least environmentally damaging practicable alternative where "practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes [Section 230.3 (q)].

Nucor originally preferred to locate this project along the eastern seaboard (The recent Nucor mill constructed in Berkeley County, South Carolina was determined by Federal and State Agencies to be a water dependent project). The State of North Carolina was one of many states eager to find Nucor a suitable site. The first site Nucor physically visited was the Corbett site outside Wilmington, North Carolina. After many months of investigating sites all over the east and gulf coasts, and along the Mississippi River and its tributaries, the North Carolina Department of Commerce in Hertford County brought Nucor to the site on the Chowan River near Tunis.

1.1 PROJECT PURPOSE AND IDENTIFICATION OF TRADE AREA

Beginning in 1997, Nucor began investigating the steel plate market for a possible expansion of their product offering. The markets are split between flat cut plate and coiled plate with the majority in discreet flat plate. Although the national markets have several established competitors already, there appeared to be an opportunity for a new supplier either in the Mid-Atlantic coast area or the Midsouth/Midwest area.

Nucor Steel proposes to develop a steel plate mill with all attendant facilities and services on an approximately 900-acre site in northern Hertford County, adjacent to the Chowan River. Operation of the Nucor Steel mill is dependent on water transportation to provide raw materials used in steel making. The proposed site allows Nucor Steel to operate in a location with suitable water access and in close proximity to raw materials and markets for its finished product.

2.0 ALTERNATIVE ANALYSIS

2.1 IDENTIFICATION AND CRITERIA FOR SUITABLE SITES

In May of 1997, Nucor evaluated twenty-five sites along the Atlantic Coast, Gulf Coast, the Mississippi River and its tributaries looking for suitable sites for the proposed steel plate mini mill. Critical requirements for site selection include close proximity to raw materials and markets. To achieve this goal, Nucor Steel began its site selection process starting with the following broad criteria.

- Water transportation - Success of this Steel mini-mill is dependent on delivery of raw materials by water, this is the most economical means of delivery and critical to the financial operation of the mini mill. Even if Nucor were on the Mississippi River, scrap would be coming by barge from the New York area, because it is one of the few scrap rich areas of the country. Nucor preferred a site with access for ocean-going barges to transport raw materials over long distances. Sites with river barge capability were considered when it was economical to transload ocean-going barges to river barges. It takes about 10 river barges to carry the tonnage of one ocean-going barge. The Tunis site is only accessible by river barge, however, ocean barges will be transloaded to river barges in Norfolk, Virginia or Morehead City, North Carolina.

- Site size - The ideal site size is approximately 1000 acres, with a minimum acreage of about 700 acres. This size site allows Nucor to place the main facility and supporting infrastructure in the center of the site to minimize disturbance of adjacent landowners and for best use of

the land.

- Electricity - A strong electrical grid is needed since electricity is the primary energy source. To recycle the quantities of scrap envisioned about 160 megawatts of electricity are needed and a 230kv line is preferred. The electricity must be from a supplier who is capable of delivery at economical rates since the cost of electricity is a major component of finished steel costs.

- Natural gas - Natural gas must be available in large quantities at an economical price.

- Rail transportation - Transportation by rail for both finished project and materials used in the production process must be available to the site.

- Environment - Environmental factors that would prevent or impede development, significantly reduce the area suitable for development, or substantially increase development cost, including wetlands, threatened and endangered species, cultural resources and known or potential contamination must be minimal. The ability to adhere to environmental laws and regulations without jeopardizing the long term competitiveness and objectives of Nucor in the market place must be present.

- Zoning - A site with appropriate industrial zoning or zoning which in all likelihood could be changed to accommodate such a facility.

- Water - Sufficient groundwater must also be available for use in the production process and preferred to be of chemistry with minimal chlorides.

- Land - Property owners willing to sell at a reasonable price.

- Governmental - Support from state and local governments is critical.

3.0 ALTERNATIVE SITES STUDIED

The following sites were then evaluated in order to determine the most practicable alternative.

3.1 Atlantic Coast, Gulf Coast, and Mississippi River (Primary sites)

Corbett, Wilmington, North Carolina
Tunis, Hertford County, North Carolina
Green Mount, Williamsburg, Virginia
West Point, King William County, Virginia

3.2 Atlantic Coast, Gulf Coast, and Mississippi River (Secondary sites)

Mobile, Alabama
Little Rock, Arkansas
McGehee, Arkansas
Jacksonville, Florida
Minnie, Alice, and Saint Louis Plantations, Louisiana
Greenville, Mississippi
Cape Fear, North Carolina
Berkeley County, South Carolina
Port Royal, South Carolina
Memphis, Tennessee
Tiptonville, Tennessee
Suffolk, Virginia

3.3 Tennessee and Tombigbee Rivers (Tertiary sites)

Barton, Alabama
Ridgeport, Alabama
Lawrence County, Alabama
Scottsborough, Alabama
Burnsville, Mississippi
Columbus, Mississippi
Iuka, Mississippi
Dayton, Tennessee
Oakridge, Tennessee

4.0 ANALYSIS OF TWENTY-FIVE ALTERNATIVE SITES

The sites were evaluated relative to the location, access, and site characteristics as they existed in 1997. When during the evaluation of potential alternatives, it was discovered that the site was not a viable option for development, further practicability and environmental evaluations ceased.

4.1 TERTIARY SITES

These nine sites along the Tennessee and Tombigbee Rivers were identified as suitable sites based on site size and potential navigation access. These potential sites are located in the following places: Barton, Ridgeport, Scottsborough and Lawrence County, Alabama; Burnsville, Iuka and Columbus, Mississippi; Dayton and Oakridge, Tennessee. However, they were considered tertiary sites for several reasons and considered impracticable.

The most crucial criteria in evaluating these sites included transportation costs. Time and fuel costs generated by shipping further inland along the Tennessee or Tombigbee Rivers are significantly higher than what is reasonable for Nucor in order to operate a scrap steel recycling facility. While these sites generally met some criteria such as site size and river barge access, the freight rate was extremely excessive when compared to those sites that were located on or closer to primary waterways.

4.2 SECONDARY SITES

These twelve sites located along the eastern seaboard, gulf coast and Mississippi River were identified as suitable sites based on site size and potential navigation access. These sites include: Mobile, Alabama; Little Rock and McGehee, Arkansas; Jacksonville, Florida; Minnie, Alice, and Saint Louis Plantations, Louisiana; Greenville, Mississippi; Cape Fear, North Carolina; Berkeley County and Port Royal, South Carolina; Memphis and Tiptonville, Tennessee; and Suffolk, Virginia.

However, after further preliminary investigations, they were considered secondary sites for several reasons and eventually all determined to be impracticable. Nucor discontinued further investigations at these secondary sites because significant constraints, including air quality permitting, unreasonable

electricity costs, additional navigability and transportation cost, geotechnical concerns, and environmental and land use issues that included wetlands and endangered species, made development of a scrap steel recycling facility at these locations impractical.

4.3 PRIMARY SITES

Each of the primary sites presented some suitable development qualities, thereby, qualifying the site for more extensive investigation by Nucor Steel for operational logistics and potential environmental impacts. When during the evaluation of potential alternatives, a probable "fatal flaw" was discovered on a site, further practicability and environmental evaluations ceased and the site was dropped as a viable option for development. Ultimately, the Hertford County, North Carolina site was chosen because it provided the best practicable alternative (Table 1).

4.3.1 Corbett Site, Wilmington, North Carolina

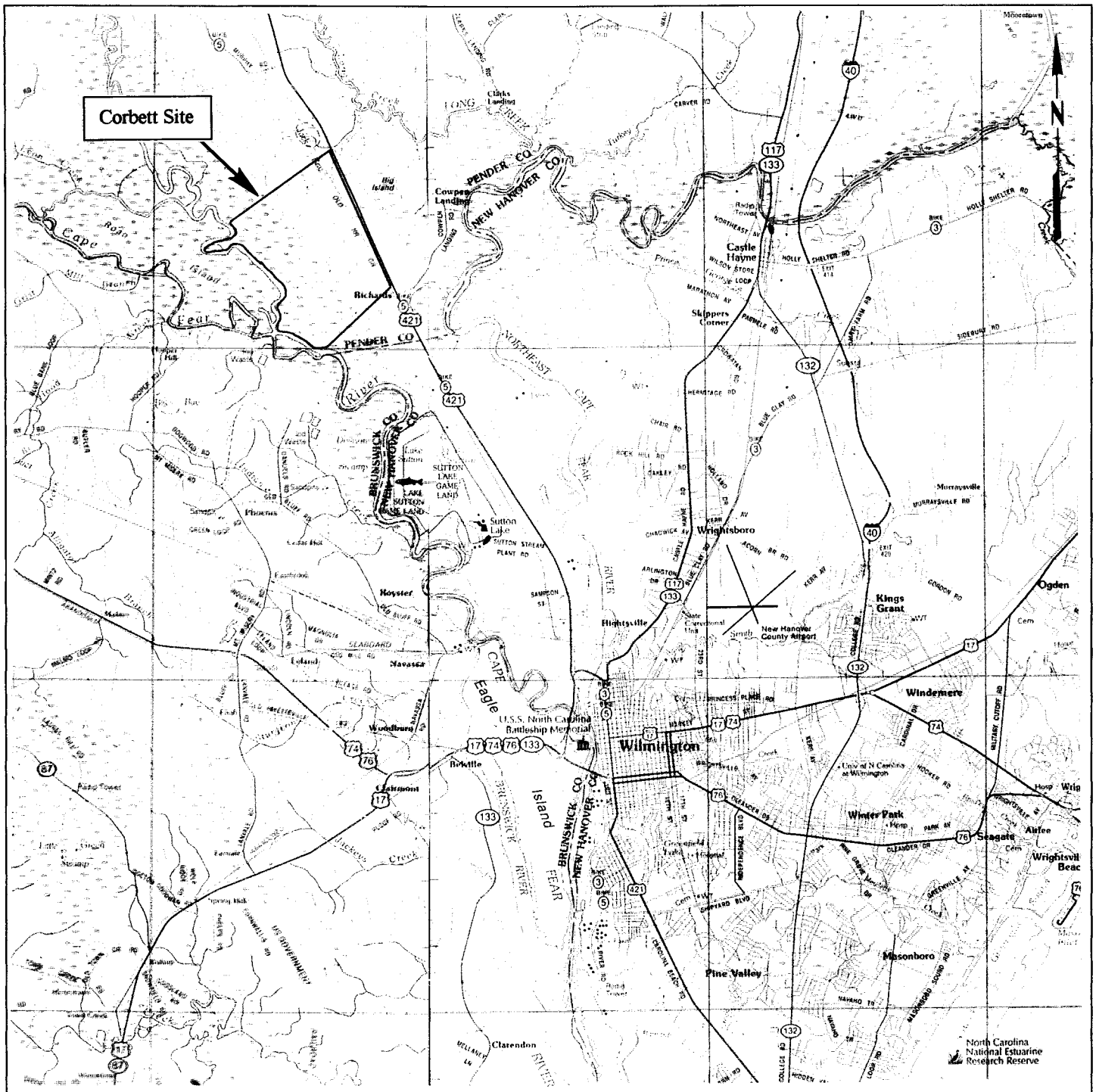
The Corbett Site, an approximately 1800-acre site in Pender County, North Carolina is located along the Cape Fear River (Figure 1). This site is not practicable for Nucor's project because of potential impact to environmental resources and complicated logistics associated with suitable transloading capabilities and railroad configuration. The site was originally identified as a deep water site. Further investigations of the river channel indicated that ocean-going barges would not be able to travel further upstream than milepost 10. The Corbett site is located above milepost 14 on the Cape Fear River. Then Nucor investigated bringing river barges to the site. There is approximately one mile of wetlands between the Cape Fear River and high ground on the Corbett Site (Figure 2). Approximately 20 +/- acres of cypress swamp would be impacted by dredging a channel from the site to the Cape Fear River. Obtaining a Section 404 permit for site development and channel construction was problematic. The alternatives of building a road or trestle from the Cape Fear River to the site were eliminated for cost considerations. In addition, other significant wetland areas associated with Carolina Bays (Jack Bay and Long Bay) and smaller depressions exist on the site. Development of this site may have increased the total wetland impact acreage above the 20 acres needed for the river barge channel. A comprehensive protected species survey

Alternative Site Selection Criteria

Table 1.

	Site Size	Electricity Access/ reasonable cost	Natural Gas	Rail	Sufficient Ground-water Availability On-site	River Barge Access to Site	Channel Dredging Required	Suitable transloading Facilities	Wetlands On-site	Protected Species On-site	Cultural Resources On site	Cultural Resources Off-site	Recorded Environmental Contamination	Probability of Industrial Zoning	Ownership/ Availability/ Cost
Corbett Site, Wilmington, North Carolina	1,800-acres	On-site/ No	1.5 miles from site	2 miles from site	site eliminated prior to investiging groundwater	Yes	Yes 20 -acres through Dollison Swamp	No	Yes Carolina Bays Dollison Swamp Site eliminated prior to delineation	site eliminated prior to investiging for protected species RCW habitat identified on-site by CSX	site eliminated prior to investiging for cultural resources	site eliminated prior to investiging for cultural resources	No	Yes	Multiple/ available/ reasonable
Tunis Site, Hertford Co., North Carolina	900-acres	230 KV Line 5.2 miles from site, 3 mile of utility corridor provided by Nucor/ Yes	3 miles from site, utility corridor provided by Nucor	3 miles from site, utility corridor provided by Nucor	Yes	Yes	No	Investigating existing facilities in Norfolk, Va. And Morehead City, N.C.	Yes 16.38-acres	No	Yes	No	No	Yes	Multiple/ available/ reasonable
Green Mount Site, Williamsburg, Virginia	1300-acres	34.5/12.5KV; 3-phase serves site 115 KV line on-site upgrades required/ Yes	On-site	Less than .5 mile from the site	No Well water rights needed to be purchased from adjacent landowners	yes	Yes 12 -acres through shallow water habitat	Yes	Yes Site eliminated prior to delineation	site eliminated prior to investiging for protected species	Yes	Yes Numerous nearby properties listed on NRHP and other cultural resource sites	Yes Metals identified in area required for dredging	Yes	Multiple/ available/ unreasonable
West Point Site, King William County, Virginia	897.5-acres	230 KV Line less than 1 mile from site/ Yes	minimum of 8 miles away from connection	On-site	site eliminated prior to investiging groundwater	Limited access for river barges	Yes for Ocean barges to access West Point Amount not determined	No	Yes 154.77-acres	Yes	Yes	Yes Numerous nearby properties listed on NRHP and other cultural resource sites	Limited debris found on-site. 4 UST locations adjacent to site. Testing was not conducted on or around the USTs.	Yes	Multiple/ available/ reasonable

Note: Investigations were conducted on the proposed utility corridor for the Hertford County site. Proposed utility corridors for the other alternative sites were not yet identified.



Source: North Carolina Atlas and Gazatteer 1997

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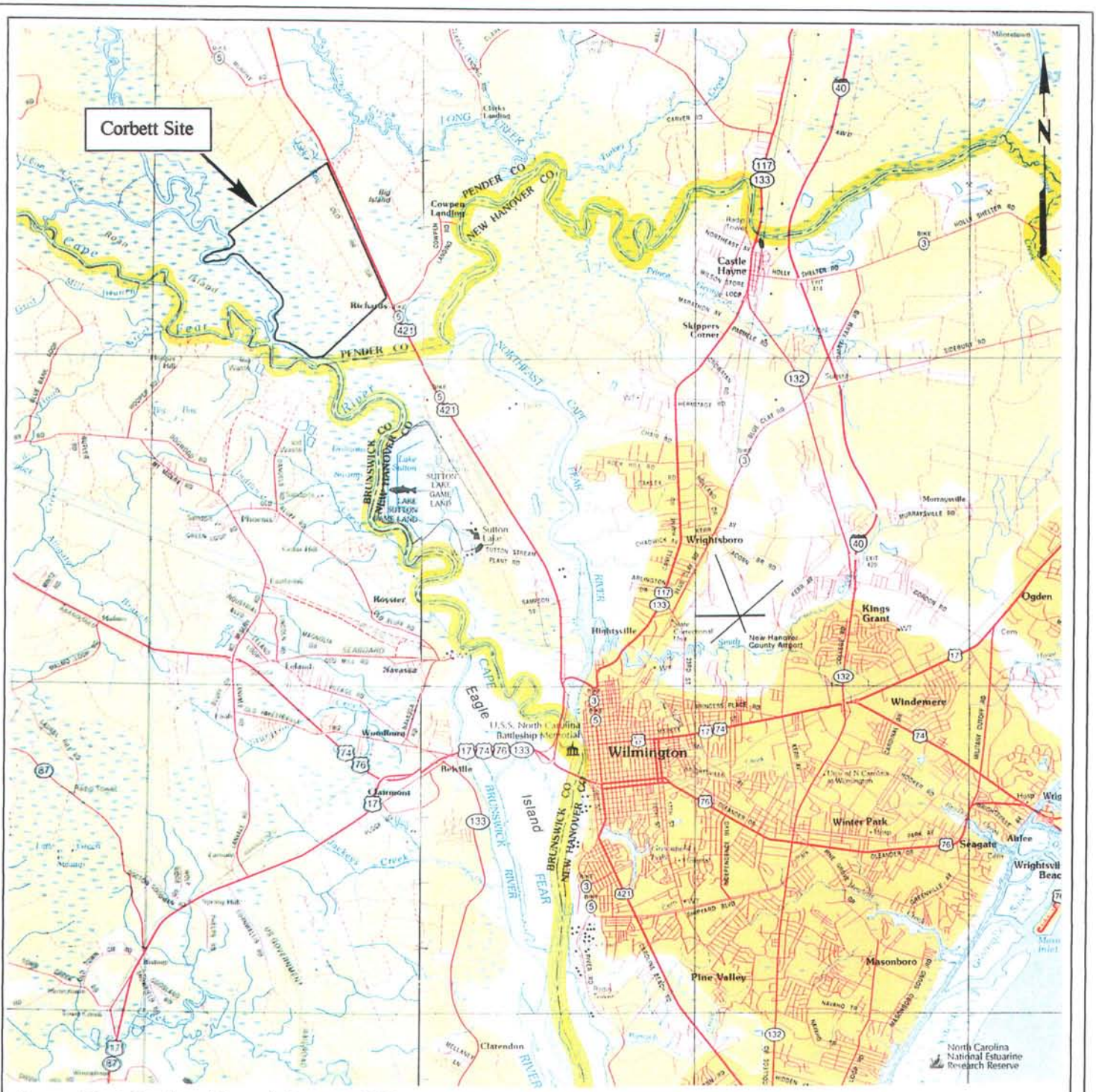
Corbett Site
Pender County
North Carolina

Regional Location Map

Figure 1



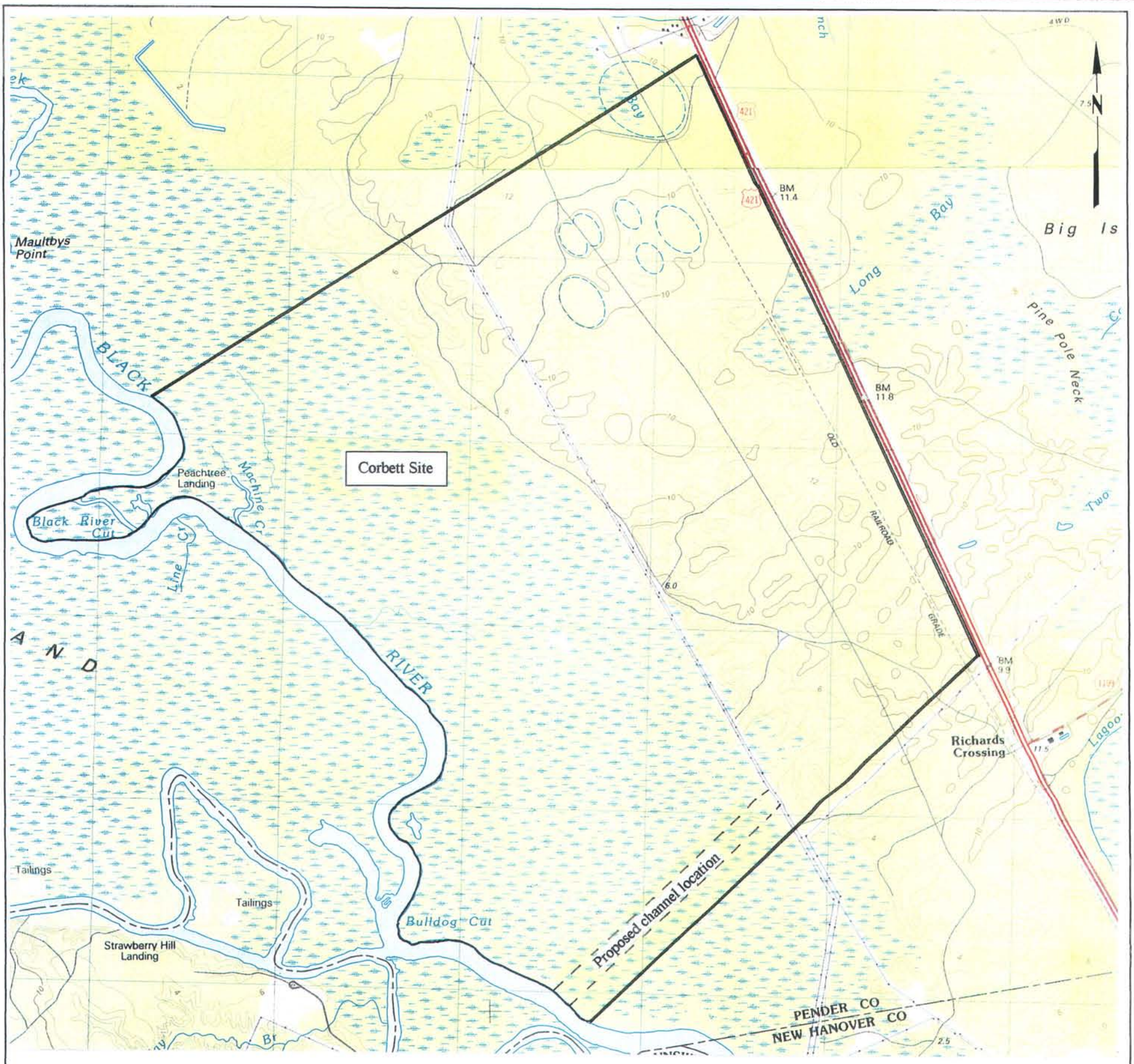
Source: North Carolina Atlas and Gazatteer 1997

NEWKIRK
ENVIRONMENTAL, INC

Corbett Site
Pender County
North Carolina

Regional Location Map

Figure 1



Source: USGS 7.5 Min. Quads. Currie, N.C. 1983 and Leland, N.C. 1984

NEWKIRK
ENVIRONMENTAL, INC

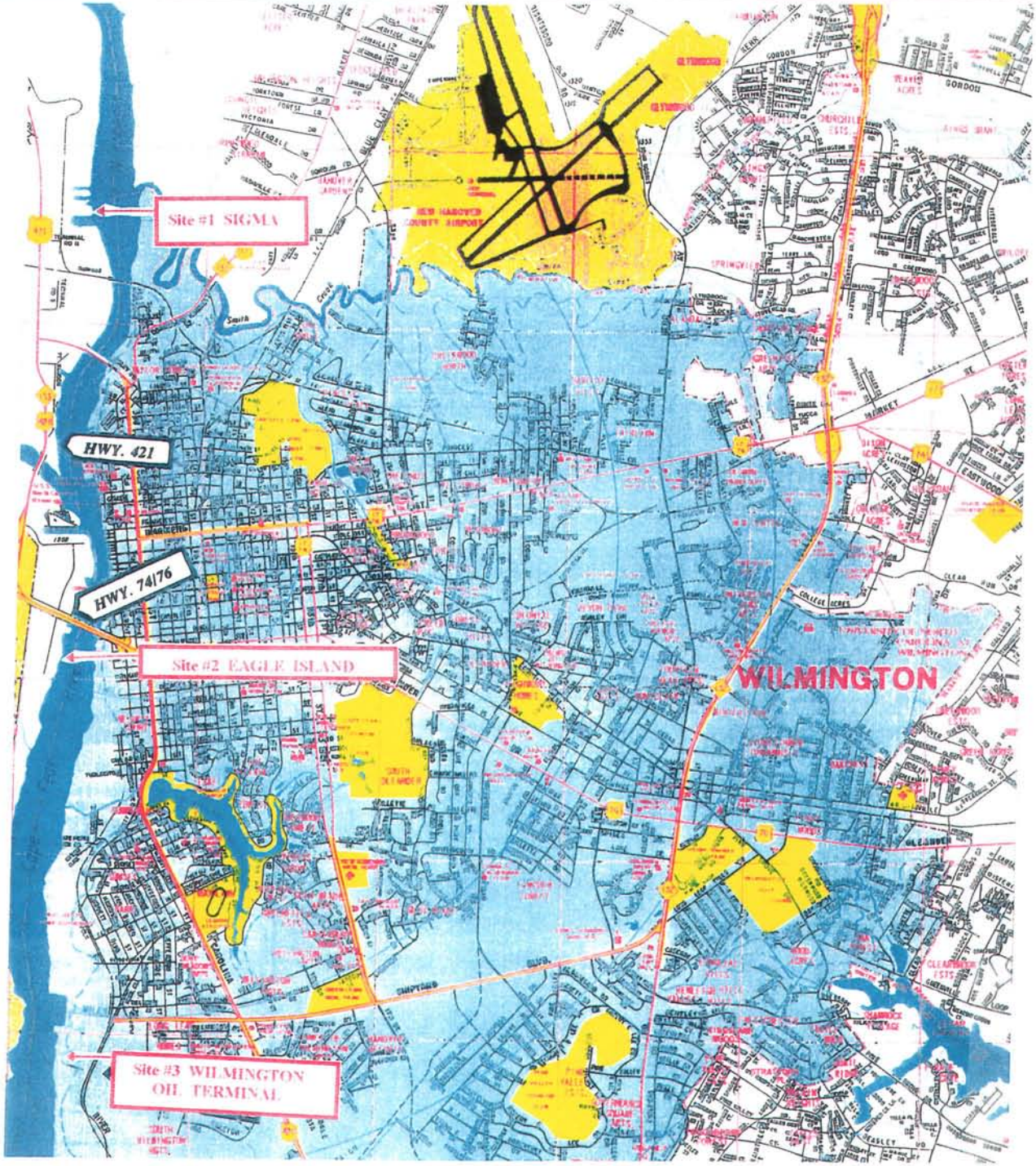
Corbett Site
Pender County
North Carolina

Site Location Map

Figure 2

was not completed for this site. However, suitable habitat for the red-cockaded woodpecker was identified on the southeastern portion of the property and approximate boundaries were shown on the Conceptual Railroad Track Layout provided to Nucor by CSX Railroad. In addition, records from the USFWS and N.C. Department of Natural Heritage indicate a number of threatened and endangered species that may occur in Brunswick County. This includes numerous collections of the federally endangered shortnose sturgeon (*Acipenser brevirostrum*) within the Cape Fear River.

Nucor conducted an investigation to find a site near Wilmington for transloading barges and bringing material eight miles to the site by rail. Nucor's search for transloading sites required sites that were readily available and reasonably ready for industrial barge activities. CSX Railroad assisted in the search for sites that were capable of supporting the logistical operations of transloading to rail at a reasonable cost. Three sites, Sigma Marine, Eagle Island Layberth, and Altamar/Wilmington Terminal (Figure 3), were identified as the best possible alternatives for transloading locations. These few available transloading options that provided deep water access were eliminated for the following reasons. Sigma Marine is a "Brownfield" property that is an active remediation site with multiple environmental problems including lead contamination in soil, petroleum products in soil, and a large area of asbestos contaminated soil. The property owners were also cited for burning violations and oil spills to surface waters. Construction of the berth would require bulkheading and extensive investigation of sediment contamination. Nucor was not willing to use a brownfield site with known contamination. The Eagle Island Layberth did not have rail access. The Altamar/Wilmington Terminal is a 65-acre tract with 21.2 acres of uplands (includes roadway and islands) that were built from dredge material. The remainder of the site is comprised of 31-acres of CAMA salt marsh and 12.8-acres of freshwater wetlands. Design for rail access presented difficult complications. Nucor was also concerned about possible "brownfield" contamination associated with dredge material on-site. Finally, the site did not contain a dock, barge slip, or other infrastructure needed for port.



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Corbett Site
Pender County
North Carolina

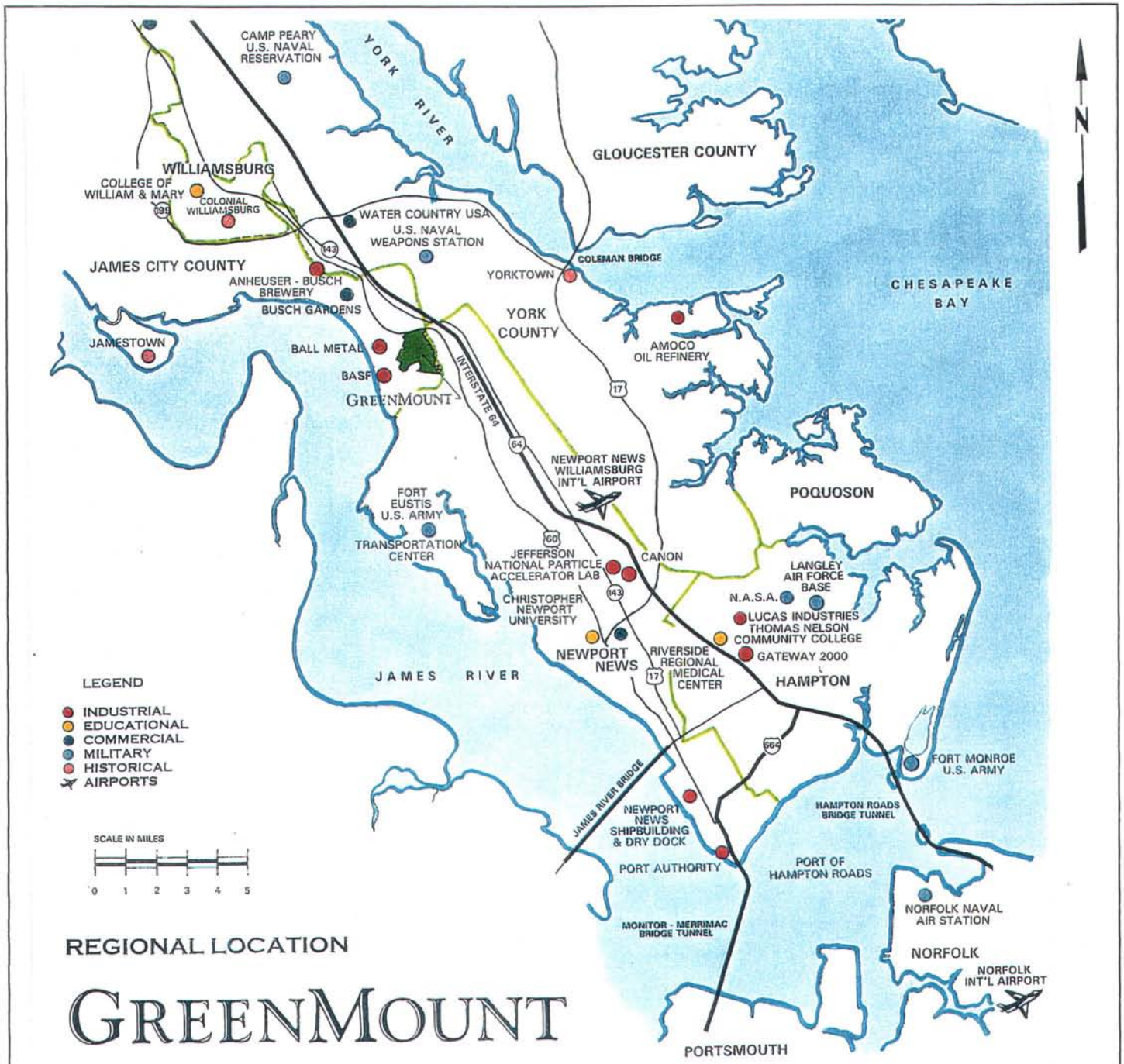
Transloading Sites
Location Map

FIGURE 3

4.3.2 Green Mount Site, Williamsburg Virginia

The Green Mount Site, a 1,300 acre site in Williamsburg, Virginia is located along Skiffes Creek, Skiffes Creek Reservoir, and Wood's Creek adjacent to the James River (Figure 4). This site is not practicable for Nucor's project because of potential impacts to environmental resources, historical landmarks and structures, and site acquisition costs. To make this site available for barge access a new channel would be required from the mouth of Skiffes Creek to the site, approximately 0.5 miles. The Preliminary Engineering Report for Dredging in Skiffes' Creek (January 1998), conducted by Langley and McDonald, stated that a suitable channel would need to be 200 feet wide and early projections indicated that approximately 618,000 cubic yards would be dredged from shallow water habitat during construction (Figure 5). This would be a total impact to tidal wetlands/Waters of the U.S. of approximately 12 acres. A delineation was not completed on-site, however, a review of topographic and NWI maps indicate several areas that contain jurisdictional streams and wetland areas. Development of this site may have increased the total wetland/Waters of the U.S. impact acreage above the 12 acres needed for the barge channel. Nucor was also concerned about possible contamination of dredge material from past industrial discharges into Wood's Creek and Skiffes Creek by an adjacent abandoned chemical manufacturing facility. The laboratory Report of Analysis from Universal Laboratories dated May 19, 1998 identified the presence of metals in the grab samples taken from the area proposed for dredging. Disposal of dredged material from the channel would be a tremendous added expense with the likelihood of handling and disposing of contaminated dredged material. The areas bordering the entire length of Wood's Creek, Skiffes Creek, and Skiffes Creek Reservoir are defined by the Chesapeake Bay Preservation Act as Resource Protection Areas and have limited development potential (Figure 6). Resource Protection Areas are regulated and require additional permitting before development may occur.

State records and physical evidence indicate the probability of significant historical and archeological sites on the property. There are four sites on the Green Mount property that are registered with the Virginia Department of Historic Resources. In addition, there are



REGIONAL LOCATION

GREENMOUNT

WILLIAMSBURG, VIRGINIA

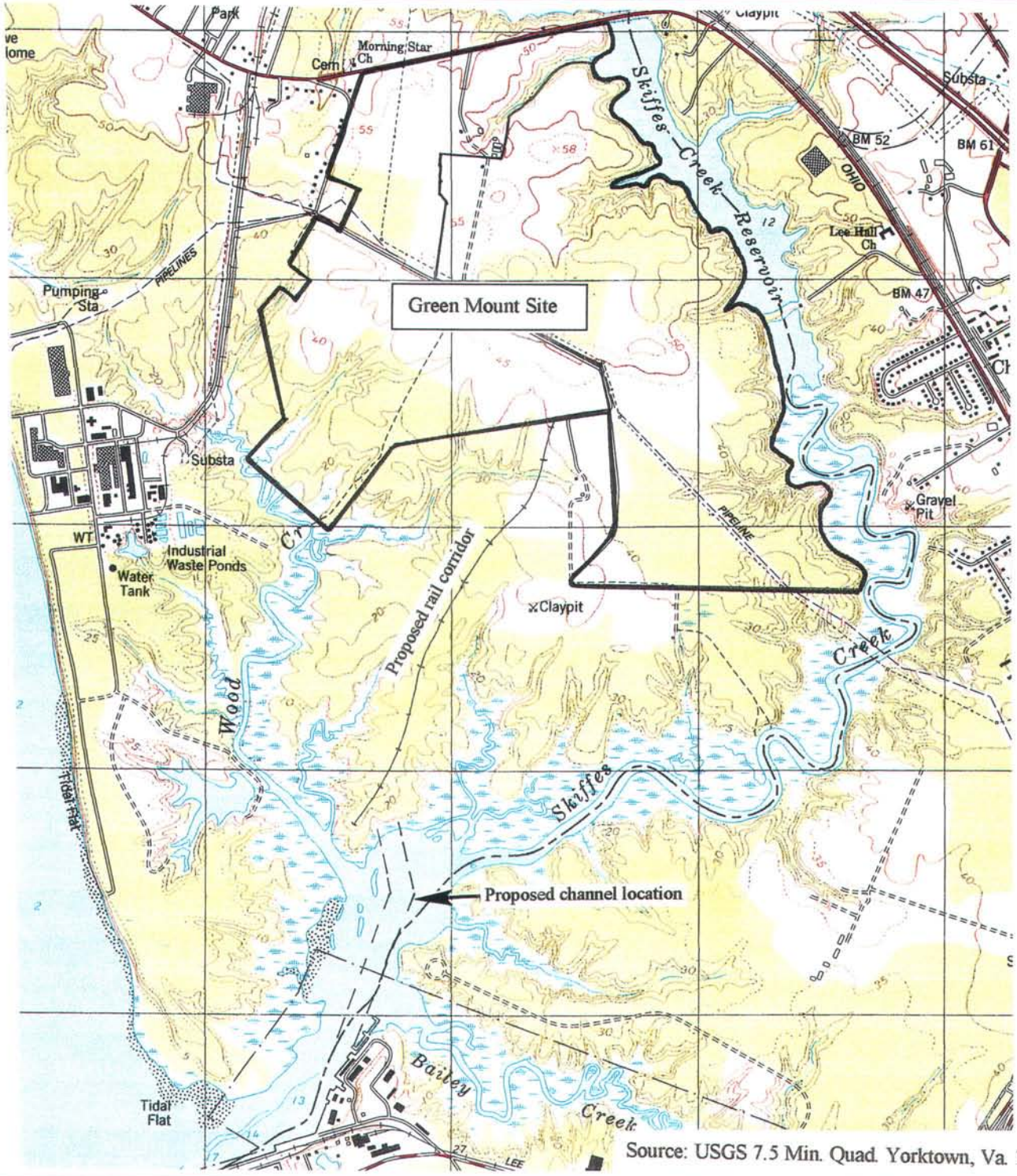
Source: Langley and McDonald, P.C.

NEWKIRK
ENVIRONMENTAL, INC

Green Mount Site
James City County
Virginia

Regional Location Map

FIGURE 4



Source: USGS 7.5 Min. Quad. Yorktown, Va. 1984

NEWKIRK ENVIRONMENTAL, INC

Green Mount Site
James City County
Virginia

Site Location Map

FIGURE 5

FIGURE 6

Green Mount Site

James City County, Virginia

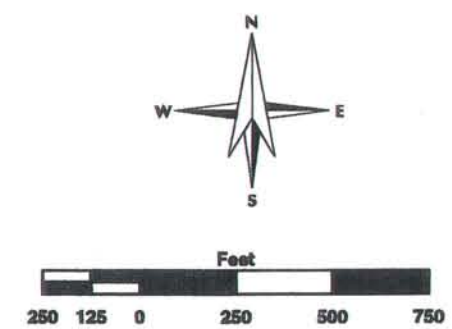
Site Boundary

Resource Protection Area

Resource Management Area

James City County
Mapping Department

United States Geological Survey



numerous historical properties surrounding or within close proximity to the site (Figure 7), including, Carter's Grove Plantation (approximately 1 mile), Colonial Williamsburg, Colonial National Historic Park and Jamestown. The Green Mount property was once part of the Carter's Grove Plantation property. "The proximity of Green Mount to water -- Skiffes Creek and the James River-- make it probable that there are additional archeological sites on the property. Numerous small prehistoric sites (including one major village) were found along the opposite bank of Skiffes Creek during a comprehensive archeological survey of Mulberry Island. It is likely that the same situation exists on the Green Mount side of Skiffes Creek[1]."

The Virginia Department of Conservation and Recreation prepared a report (Conservation Planning for the Natural Areas of the Lower Peninsula of Virginia) for James City County that identified a 160-acre area around Grice's Run approximately one mile west of the Green Mount site (Figure 7). Grice's Run Natural Area harbors a small exemplary natural community. The southern mixed hardwood forest exhibits characteristics of old growth forests that make it a significant natural heritage resource.

Groundwater availability at this site is limited by water withdrawals from adjacent industry. Nucor would have to acquire ground water from adjacent industries in order to meet their daily water needs. The final constraint was the asking price per acre, which was excessive to the point that Nucor's long term competitiveness in the marketplace could be impacted.

4.3.3 West Point Site, King William County, Virginia

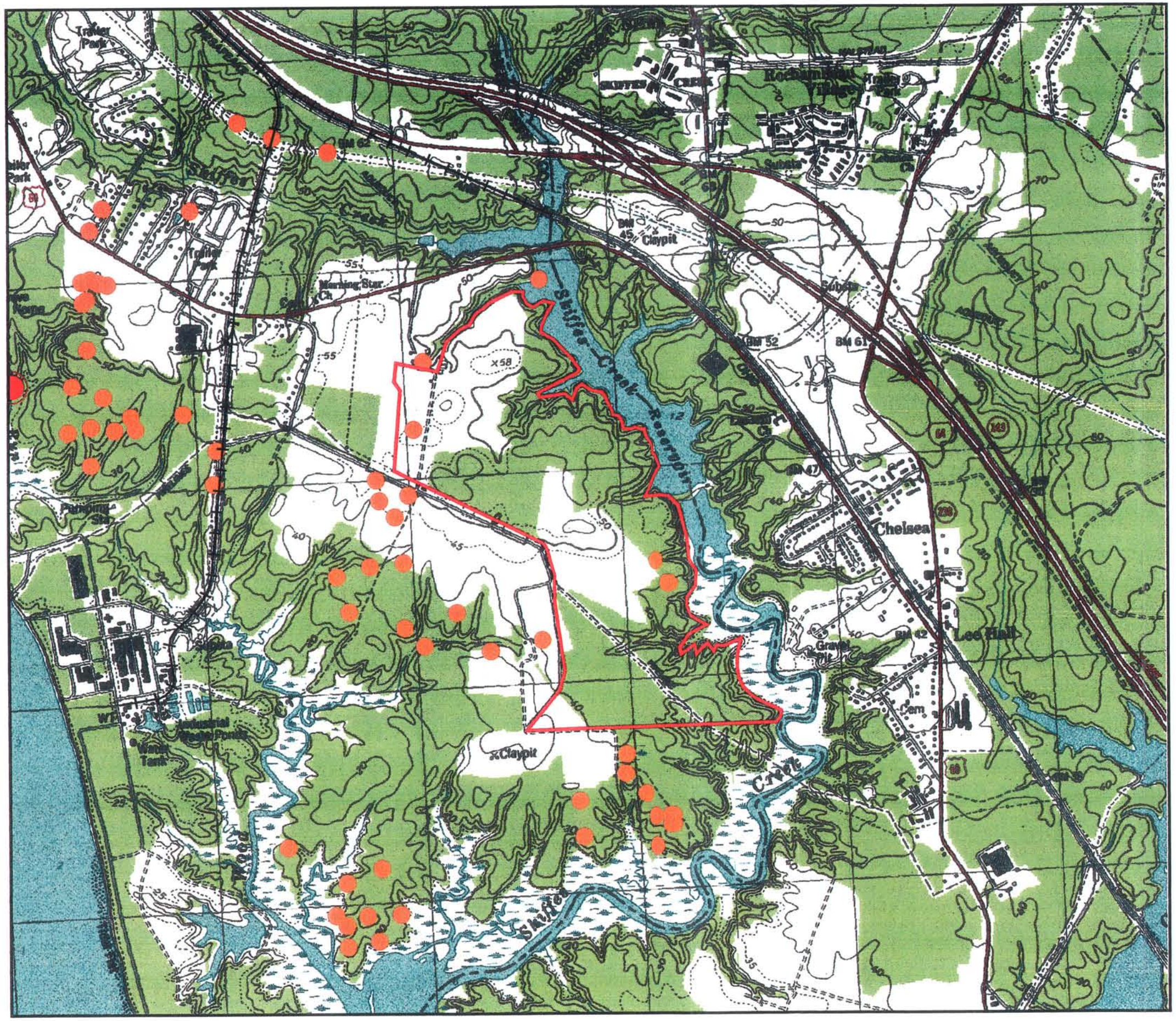
The West Point Site, an 897.5-acre site in King William County, Virginia, is located along the banks of the Pamunkey River (Figure 8 and 9). This site is not practicable for Nucor's project because of environmental and other constraints. The wetland delineation, conducted by Newkirk Environmental, Inc. and shown on a survey plat prepared by Dillard and Marion

[1]Green Mount, A request for Environmental Information, Environmental Services of Rickmond Engineering, Inc. December 1990.

FIGURE 7

Green Mount Site

James City County, Virginia



Site Boundary

Historical Resources

Threatened and Endangered Species

James City County Mapping Department

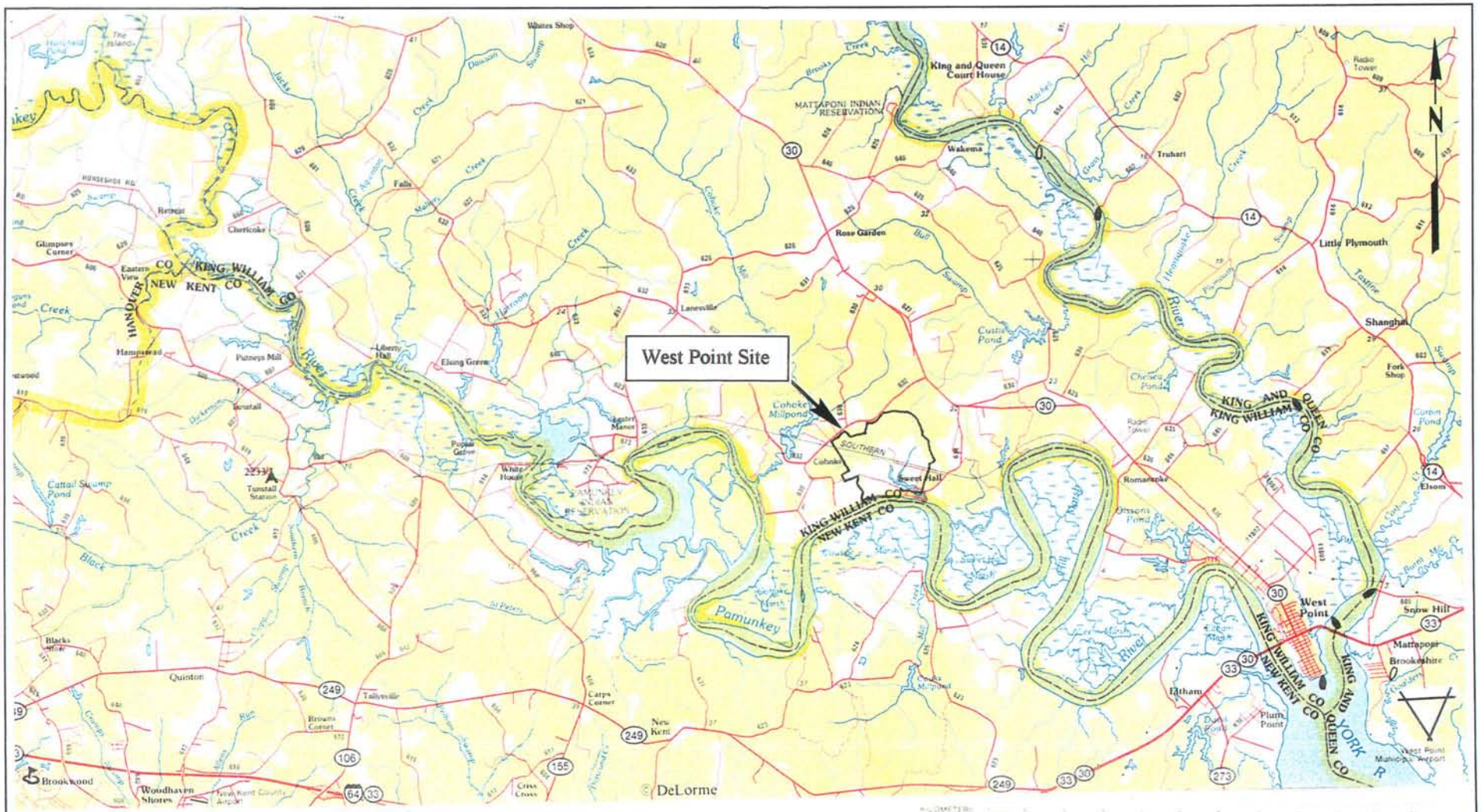
United States Geological Survey

Department of Conservation and Recreation Division of Natural Heritage

N
W E
S

Feet

250 125 0 250 500 750



Source: Virginia Atlas and Gazatteer 1989

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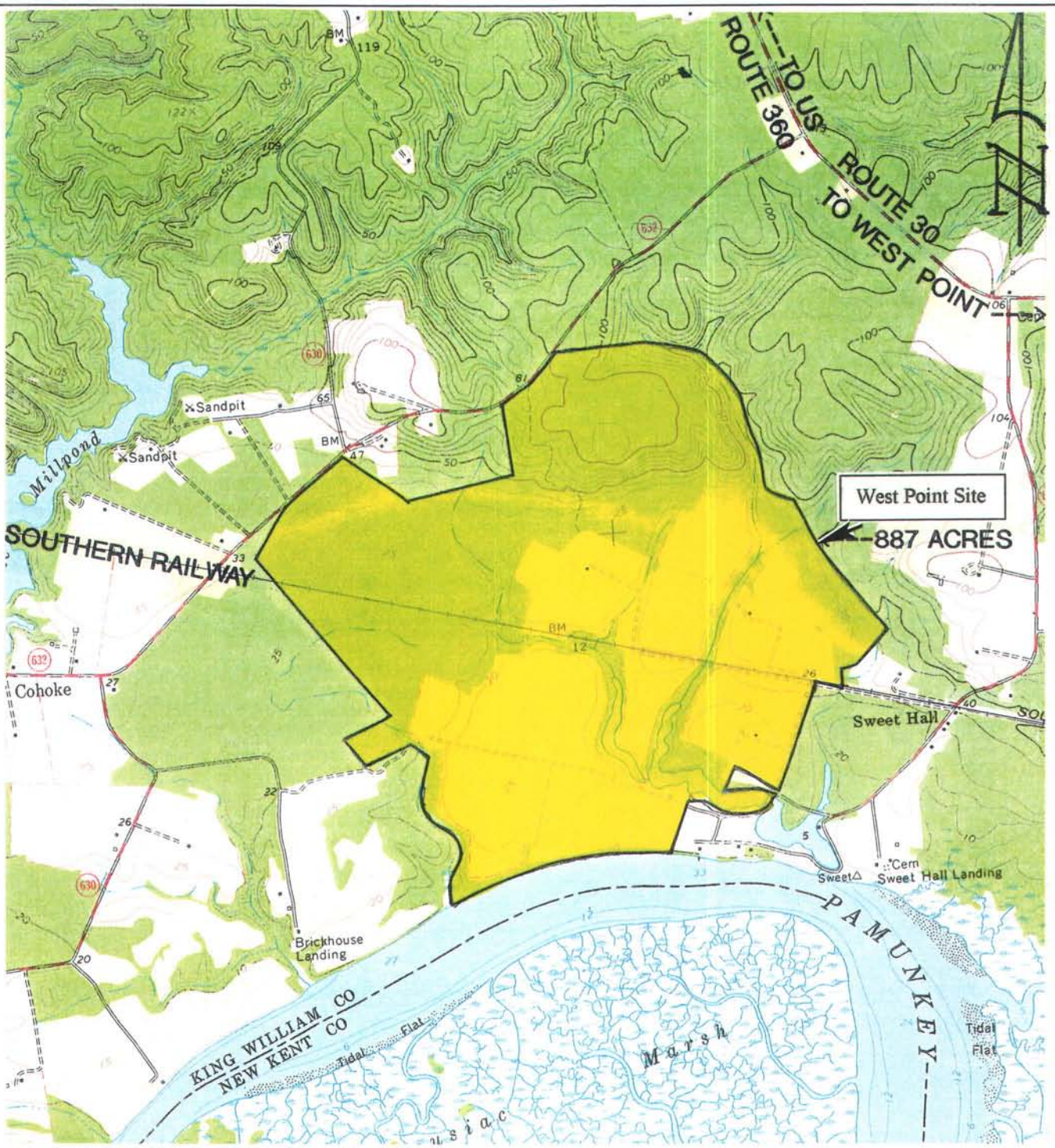
West Point Site
King William County
Virginia

Regional Location Map

FIGURE 8



Source: USGS 7.5 Min. Quad. New Kent, Va. 1978

NEWKIRK
ENVIRONMENTAL, INC

West Point Site
King William County
Virginia

Site Location Map

FIGURE 9

P.C., shows that there are approximately 154.77-acres of wetlands contained within the site. Additionally, correspondence from the Virginia Department of Game and Inland Fisheries indicated that this site contained an active bald eagle's (*Haliaeetus leucocephalus*) nest. During the time of the study the bald eagle was listed as a federally endangered species. Other species of concern included the federally threatened sensitive joint-vetch (*Aeschynomene virginica*) which was observed immediately downstream of this site within the Sweet Hall Marsh and in several other locations upstream and the state threatened/federal candidate Henslow's sparrow (*Ammodramus henslowii*) which was observed nesting on the subject site. Another major concern was surface drainage. The geotechnical report conducted by Hall Blake and Associates stated that the "drainage is moderate to poor"and that "the site must be raised at the location of the plant to develop surface drainage."

Nucor investigated bringing ocean barges to West Point and transloading them to river barges, however, the upstream reaches of the Pamunkey River from the city of West Point to the site are narrow and are only accessible to one barge at a time. The other option investigated was to unload barges at West Point and ship the scrap material to the site by rail, increasing the cost considerably and creating significant rail and traffic congestion within the city of West Point. In addition, the mouth of the Pamunkey River would require dredging to allow ocean barges to reach the port at West Point. The available port in West Point was only marginally suitable due to its small size and deteriorating dock. The port servicing the site was located in West Point on the York River, immediately east of Highway 33, the main traffic artery in the city of West Point. Rail traffic servicing the site from the port had potential to cause delays in vehicular traffic on Highway 33 and other roads within West Point.

The nearest natural gas supply was over eight miles away in West Point or from a distribution facility in New Kent County. Natural gas service from West Point was contingent upon a proposal to build a cogeneration facility in West Point. Natural gas from New Kent County was available but only at a tremendous additional expense to Nucor. This project is <u>not</u>

feasible without sufficient, affordable natural gas.

A cultural resource reconnaissance was conducted by Brockington and Associates, Inc. This study found that there are three National Register Properties very close to the project tract. These include the Pamunkey Indian Reservation Archeological District located approximately 3.5 miles west of the project tract, the Windsor Shades (Waterville) house and property located approximately 400 feet east of the project tract, and the Sweet Hall property located approximately 1,000 feet east of the project tract. In addition to the three National Register Properties, there are a number of other archeological sites recorded near the project. While these sites would not be affected by construction activities on the project tract, their presence indicates that the potential for archeological sites to be present within the West Point site is high. Although there are no known cultural resources on the tract, a comprehensive cultural resources study would have to be conducted to determine all cultural resources occurrences.

The final constraint included information from the Phase I Environmental Site Assessment conducted on the site by Dames and Moore - NC (DMNC). Their conclusions and recommendations based on available regulatory files, interviews with local authorities, and site reconnaissance indicate the following potential problems: (1) "Domestic debris was observed to be used to stem erosion in two depressions on the property." Cleanup was recommended followed by soil testing for oil and grease, total petroleum hydrocarbons, and pesticides; (2) "Three USTs (Underground storage tanks) and one fuel oil UST were observed adjacent to the east of the subject property. Oily stains were observed north of the USTs and around some of the workshop buildings on the adjacent property; and (3) Two drums of possible potash and other drums were observed on the adjacent property to the west." Nucor was concerned about possible contamination from the USTs and other chemical drums.

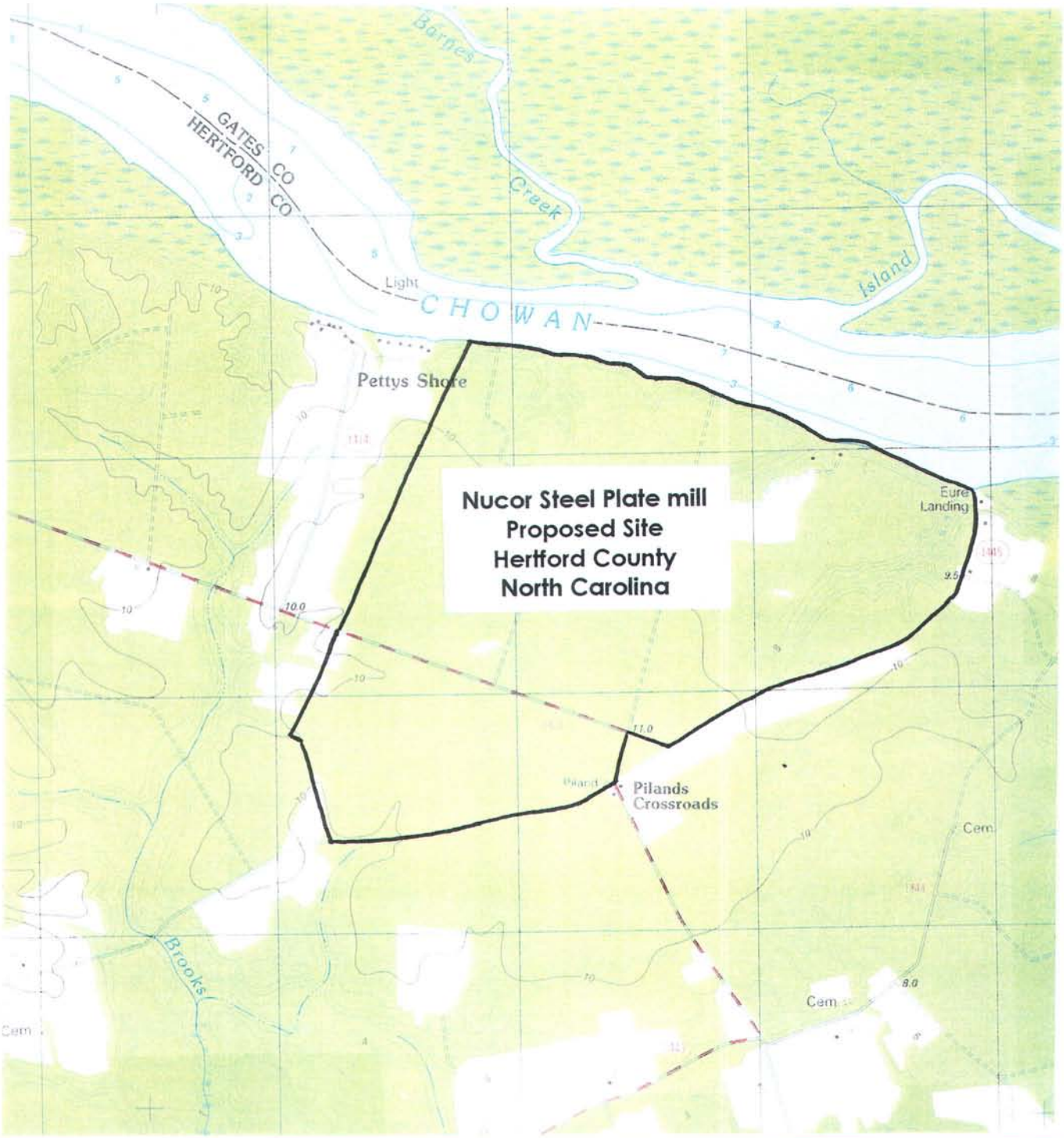
4.3.4 Tunis Site, Hertford County, North Carolina

4.3.4.1 Location and Site Use

The Tunis Site, an approximately 900-acre site in Hertford County, North Carolina, is located along the banks of the Chowan River (Figure 10). River Road/State Route 1400 crosses the southern portion of the property. This site is located within the Coastal Plain and is relatively flat to gently rolling with a few short creek systems that drain north into the Chowan River. This site was chosen as the most practicable alternative for this project. In addition to site size and access to markets, preliminary investigations revealed that the environmental conditions were relatively equal to or more suitable compared to other sites Nucor investigated for this mill and other similar Nucor mills in the recent past. For example, the Nucor mill site in Berkeley County, South Carolina impacted over 100 acres of wetlands for initial construction, expansion, and satellite industries. As noted in Section 4.3.4.5 below, the requested wetland impact within the project site at Hertford County is 2.12 acres.

4.3.4.2 Ownership/Availability

The site proposed for the steel mill currently has few owners and several uses. The majority of the site, approximately 750 acres, was owned by Champion International and managed as an industrial loblolly pine plantation. Champion holds the rights for the timber, however, prior to any timber harvesting, Champion must coordinate with Nucor. Nucor's contract with Champion International gives Nucor the right to designate a portion of the site to be utilized by the steel mill and ancillary facilities, including buffers around the site perimeter. Upon such designation, Nucor will pay Champion an agreed upon price per acre for such facility utilization, and Champion shall relinquish its timber rights with respect to such acreage. Nucor intends to exercise its contractual rights with Champion so as to maintain at all times a 200-foot buffer on the perimeter of its site. This buffer will be maintained in its current state as a forested area. In addition, Nucor has the right to purchase Champion's timber rights with respect to all or any part of the site at any time for an agreed-upon price per acre.



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Nucor Steel Plate mill
Proposed Site
Hertford County
North Carolina

Location Map

SCALE 1 inch = 2000 feet

FIGURE 10

Smaller adjacent land parcels include agricultural fields, small-forested areas, and only three residential parcels. These other parcels total approximately 150 acres. All of these are under either contract or option to purchase agreements.

4.3.4.3 Zoning and Land Use

The proposed site is located in a remote area of Hertford County with only a few residences in close proximity. There is a large area to the west of the Nucor site formerly operated by Farmers Chemical (C.F.) Industries that is zoned Heavy Industrial. Adjacent properties are zoned Residential/Agriculture or Riverside Residential/Camping.

The Hertford County Planning Board recommended that the proposed site for the steel mill be rezoned to (IH) Heavy Industrial. This recommendation was approved on Monday, August 31, 1998. Furthermore, the text of the Hertford County zoning ordinance was recommended for amendment to specifically name steel mills as a permitted use in the (IH) Heavy Industrial District. Proposed rezoning of the Nucor site would extend the Heavy Industrial corridor from Tunis to just East of Pilands Crossroads. The Hertford County board of Commissioners held a public hearing for the rezoning request on October 5, 1998, after which the Board voted unanimously to re-zone the properties needed by Nucor to IH. The Board also voted unanimously to amend the text of the zoning ordinance to specifically allow for steel mills, steel or other solid waste recycling facilities, and related loading, unloading, or transportation facilities. The minutes from the Hertford County Board of Supervisors meeting, public hearing, and voting are included as Appendix A.

4.3.4.4 Utility corridors

Utilities, including railroad line, natural gas line, and 230kv electric power line, will be brought to the site along one access corridor (Figure 11) provided and funded by Nucor. Three wetland areas are located within the utility right-of-way. Surveys for

Figure 11

Drawing Under Seperate Cover

cultural resources and endangered species include the proposed utility corridor. No cultural resources or protected species were identified within the proposed right-of-way. Mechanized land-clearing will clear forested areas within the portions of utility corridor needed for rail, gas, and electricity. No fill material will be placed in wetland areas within the utility corridor.

Electricity

The access corridor is a 250-foot wide right-of-way that is approximately 2.7 miles in length from the site to the existing railroad and natural gas connections. The electric power connection is approximately 2.2 miles further from the utility corridor in Winton. The electric power line will be above ground and the supporting power poles will avoid and/or minimize any impacts to wetland areas (Appendix B).

Rail

The current proposal is to minimize impacts to these wetland areas by building trestles for the railroad. The North Carolina and Virginia Rail Road will provide access to this utility corridor along an existing rail bed that is approximately one mile in length from the existing track to the utility corridor provided by Nucor. Correspondence from the North Carolina and Virginia Rail Road indicates that during reinstallation of this mile of track, they anticipate the removal of small brush, cleaning of the existing ditches on each side, and smoothing the existing subgrade as all that will be necessary to reconstruct this segment of track. Nucor plans to use rail cars to bring approximately 20 percent of scrap steel to the site and ship approximately 1000 tons of finished product a day. Nucor estimates that there will be 126 inbound rail cars a week. Ninety-one of these rail cars will be empty and used for shipping finished product. 35 of these rail cars will bring scrap steel or other deliveries. The weekly outbound trains will have a total of 91 rail cars of finished steel products and 35 empty rail cars.

Natural Gas

The gas line will be installed underground and adhere to Section 404 guidelines for utility line crossings in jurisdictional wetland areas. This includes restoring wetland topography to the original contour elevation and replacing the original wetland topsoil on the surface.

4.3.4.5 Wetlands

Land Management, Inc. delineated portions of the Tunis Site and identified several areas of jurisdictional wetlands and creeks that drain from the site into the Chowan River. Figure 12 indicates jurisdictional areas that will be avoided and preserved as well as the unavoidable wetland impacts.

Nucor is currently planning on building its facilities in the center of the selected site. Based upon the verified wetland delineation (Appendix J), Nucor will avoid impacts to 14.26 acres of wetlands, which will be preserved and protected by an approximate 100 foot upland buffer. Nucor is requesting a permit to impact only 2.12 acres of wetlands within the project site to accommodate construction of the mill, railroad, and ponds.

Constructing a trestle to span wetlands will minimize impacts within the utility corridor (Figure 11). There are 2.91 acres of wetlands within the utility corridor. Installation of utilities will require that only 0.58 acres of wetlands be mechanically cleared of trees to construct the railroad trestle and natural gas line. No fill impacts are needed in the utility corridor. Best Management Practices will be used within the utility corridor during the construction of the trestle and burial of the natural gas line in order to further minimize impacts to wetland resources.

Additional areas on the western portion of the site are undergoing further soil and hydrologic testing to determine whether any additional jurisdictional areas should be

Figure 12

Drawing Under Seperate Cover

included. The soils in the areas of further study are mapped by the National Resource Conservation Service and shown in the Hertford County Soil Survey as having Leaf Loam Soil, which is listed as a hydric soil. However, further studies show that the property has undergone numerous impacts associated with silvicultural activities, including ditching and bedding. Verification of the jurisdictional wetlands and Waters of the U.S. boundaries will be made by the USACE. The area of the site that is undergoing further wetland determination is not necessary for Nucor's initial development. Only if the areas under study proof to be uplands suitable for development, will they be used for future growth to accommodate support industries that may locate on the site.

Submittal of the joint application for Section 404 Permit, 401 Water Quality Certification, Coastal Area Management Major Permit, and Section 10 Rivers and Harbors Act Permit will include the final verified jurisdictional acreage, impacts to wetlands, and a compensatory mitigation plan to offset unavoidable impacts to wetland resources.

4.3.4.6 Endangered Species

The need for on-site surveys to determine the potential for occurrence of animal and plant species listed as endangered or threatened by current Federal regulations [Federal Endangered Species Act of 1973 916 USC 1531-1543) was investigated. Literature correspondence from the U.S. Fish and Wildlife Service indicated that the only protected species which potentially could occur on the site is the red-cockaded woodpecker (*Picoides borealis*), which is federally listed as an endangered species. The red-cockaded woodpecker requires open stands of pines 60+ years old for roosting/nesting habitat. Preferred foraging habitat is pine and pine/hardwood stands 30+ year old. Understory vegetation less than 5 feet is also generally preferred. The existing pine forest on the site consists primarily of a fifteen to forty year old loblolly pine plantation planted by Champion International and Union Camp Corporation. Dr.

Jay Carter III and Associates, Inc. have been retained by Nucor to conduct field surveys for the occurrence of the red-cockaded woodpecker. Investigations of the site indicate that no cavity trees and very little suitable habitat is located on or within one-half mile of the property as a result of primarily silvicultural and agricultural practices. The survey report is attached in Appendix B.

A letter dated June 9, 1998 from the North Carolina Marine Fisheries to the NOAA General Counsel for Fisheries, indicated that on April 18, 1998, a federally endangered shortnose sturgeon (*Acipenser brevirostrum*) was taken in gill nets used as part of an ongoing fisheries independent sampling program for striped bass in the Albemarle/Roanoke system. This sampling program is conducted by the N.C. Division of Marine Fisheries. The sturgeon was taken in Batchelor Bay near the mouth of the Roanoke River, approximately 30 miles downstream from the Nucor site. The Roanoke River is also used for commercial barge traffic. Both the Chowan and the Roanoke Rivers empty into the Albemarle Sound near the Town of Edenton. Prior to this take of the shortnose sturgeon, the previous known record of occurrence in this area was from 1881 near Salmon Creek. The shortnose sturgeon is believed to occur in major river systems from the St. John's River, Florida to the St. Johns River, New Brunswick, Canada. The most confirmed occurrences of the shortnose sturgeon in North Carolina are within the Cape Fear River.

"The USFWS believed that the population level of the shortnose sturgeon has declined because of pollution and overfishing, both directly and incidentally in shad gillnets." Other impacts include habitat alterations from dredging or disposal of fill materials into rivers (Synopsis of Biological Data on Shortnose Sturgeon, *Acipenser brevirostrum*, NOAA Technical Report NMFS 14, 1984). Since no dredging is proposed and construction activities for the dock are a temporary impact, navigation and a port facility on the Chowan River do not appear likely to have any impact on the shortnose sturgeon.

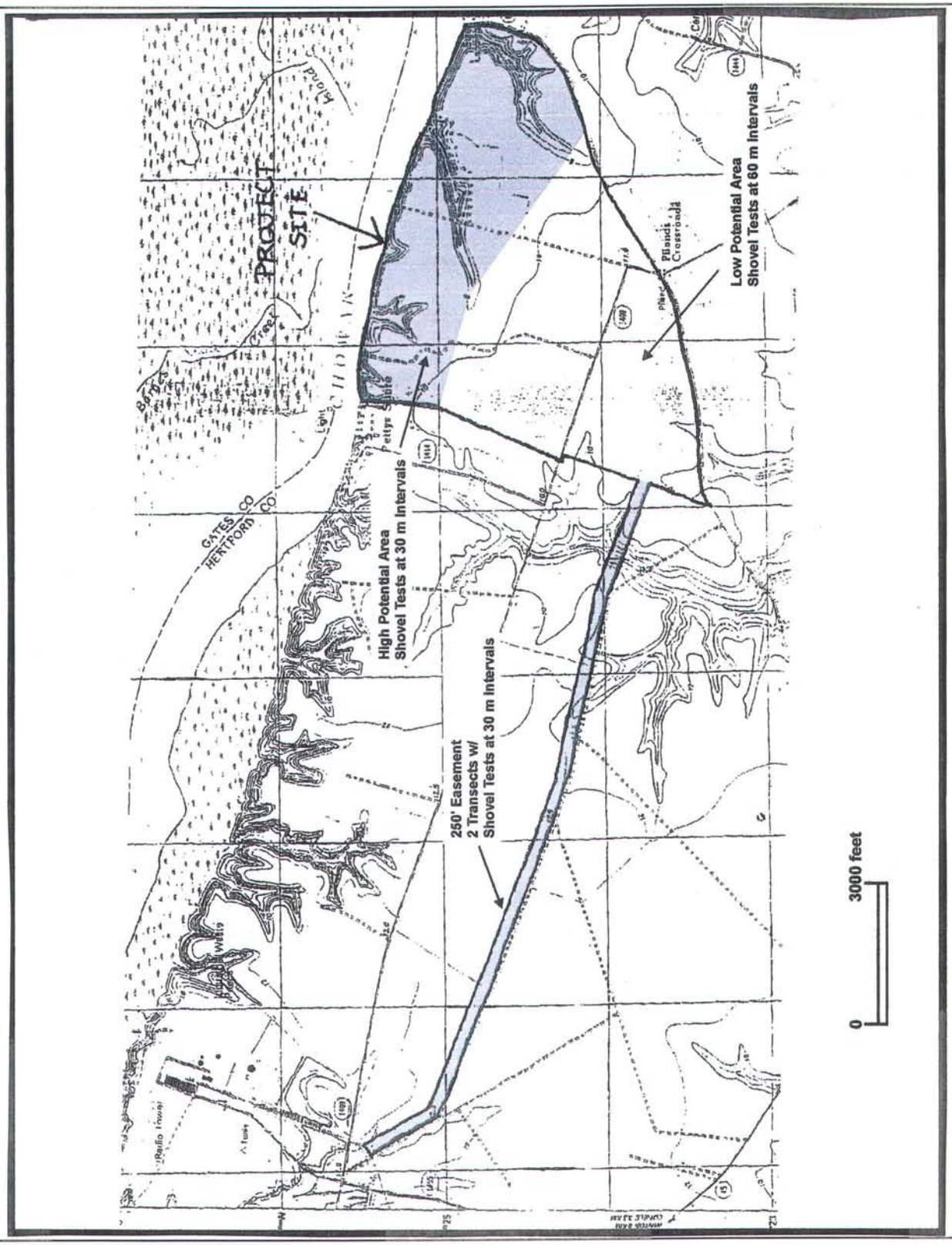
4.3.4.7 Cultural Resources

Terrestrial and underwater archeological investigations for the Tunis site were completed by Brockington and Associates (Figure 13) and Mid-Atlantic Technology respectively. Eleven sites and nineteen isolated finds were recorded on land and three underwater magnetic anomalies were recorded along the shoreline. Brockington and Associates recommends that only one (state site 31HF223) of the eleven identified land sites is potentially eligible for listing with the National Register of Historic Places and North Carolina State Historic Preservation Office (SHPO). The location of this site is in the northeast corner of the property. Mid-Atlantic Technology recommends that a minimum 200-foot-radius no-impact buffer zone be placed around one underwater target. The survey reports of both investigations are attached in Appendix C. Based on the final decision by the SHPO, Nucor will enter information with a MOA with the appropriate parties, including the N. C. State Historic Preservation Office, to either preserve the land site or recover the land site with a recovery plan approved by SHPO, and implement the buffer zone around the one underwater target.

4.3.4.8 Stormwater Management

The preliminary site plan (Figure 10) shows the approximate location of stormwater management ponds. The final location and design of the stormwater management ponds will be in full compliance with the guidelines set forth in the North Carolina Stormwater Management Policy and in accordance with necessary authorizations from North Carolina Department of Environment and Natural Resources. This includes the use of guidelines as outlined in Stormwater Best Management Practices (N.C. Department of Environmental, Health, and Natural Resources, 1995)

There are existing ditches throughout the site including along SR 1400 and SR 1445 and a portion of the ditches are delineated wetlands. Several of the ditches will be protected and incorporated into the final design.



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Archaeological Investigations
Nucor Steel, Hertford County, NC Site

FIGURE 13

of sufficient surface area to promote settling of particulate matter. In this case, sufficient surface area will be provided to remove greater than 90 percent of Total Suspended Solids (TSS). Usually, wet detention ponds are designed to provide sufficient storage above the normal pool elevation to retain the first inch of runoff for a minimum of two days and a maximum of five days. The stormwater ponds for this site are larger and designed to store water from a ten-year storm event. The result of these basic design criteria is an engineered stormwater measure that allows the majority of suspended sediment (and pollutants attached to the sediment) to settle out of the water before it is discharged to downstream waters. Retention of this stormwater runoff ensures that the water will be discharged at a rate such that downstream erosion is minimized.

4.3.4.9 Ground water

Nucor recycles the majority of water it uses in its steel manufacturing process, however, the mill operations will require an additional daily water supply, which is estimated to be less than one million gallons per day. Nucor will withdraw ground water from the upper Cape Fear Aquifer and the amount of water required by the facility should have a minimal impact on the aquifer. The Hertford County site is not in a capacity use area as defined by the State of North Carolina. Additionally, correspondence from the North Carolina Division of Water Resources (DWR) dated October 19, 1998 (Appendix D) indicates that this aquifer is adequate to supply the necessary daily water needs for the recycling mill. Even though the DWR believes there is adequate water in the aquifer to supply Nucor and no impact to adjacent wells is expected, Nucor submitted a letter dated November 5, 1998 (Appendix D) to the Hertford County Manager assuring the county that Nucor will work with county officials and property owners if ground water wells are directly affected by Nucor water usage, to provide those affected property owners with a quick and efficient remedy.

4.3.4.10 Sanitary Waste Water

Ultimately, Nucor plans on connecting to the Town of Winton waste water treatment facility. Preliminary talks between the Town of Winton and NC Division of Water Quality (DWQ) indicate that the DWQ would recommend the issuance of the sewer permit to accommodate up to 20,000 gallons per day from Nucor (Appendix E). However, Nucor believes that with their facility and related industries an expanded capacity of only 12,000 gallons is needed. Upon approval by the Town of Winton, Nucor will run a sewer line from their site to the town waste water treatment facility at Nucor's expense. Nucor will pay expansion costs to the Town of Winton for waste water facility expansion that is needed to accommodate Nucor.

Until such time permits, Nucor plans to construct a temporary "package plant" on site to handle wastewater. This temporary waste water treatment facility will meet the requirements as set forth by state and federal guidelines. Material will either be carried off-site for disposal or discharged into the Chowan River if the requirements for discharges to Nutrient Sensitive Waters are met.

4.3.4.11 Process Waste Water

The process water systems for the plate mill will include various ponds (concrete and earthen), cooling towers, pump houses, make-up water supply, internal recycling, closed/open piping throughout the facility, water level controls, water treatment, mill scale handling, etc.

Essentially two water systems will be utilized at the facility as follows: One is noted as non-contact water system. This system is for all closed piping systems such as heat exchangers, air conditioners, water-cooled piping, etc. This water does not come into "contact" with the hot steel either during melting or rolling processes. Water treatment will be used to prevent potential scaling and corrosion problems that could occur otherwise. This water is continuously recycled through cooling towers and

back through the system. Most losses are due to evaporation within the cooling towers. A concrete pond will store the needed water during operation and maintenance activities. This concrete pond only requires very infrequent cleaning and maintenance (every several years or more, dependent upon treatment needed) since it does not contact the hot steel. During cleaning and maintenance activities, the water will be drained to the process water pond either for use by the steel slag processor for cooling the hot molten slag or reused back in either the non-contact water or the contact water, dependent upon its cleanliness.

The other system is known as the contact water system. This system is for all water that comes into contact with the hot steel either during the melting or rolling process. Generally, water treatment other than settling and filtering is not needed in this system. During the melting and rolling process, mill scale (bits and pieces from the steel when cooled breaks off) is generated and collected within either a weir or settling basin. The weir or settling basin will be similar to a concrete pond. The mill scale can then be removed via mechanical means and allowed to dewater within or on a concrete platform and the water is directed back into the water system. A majority of the water losses are due to evaporation from coming into contact with the hot steel. These weirs or basins will require periodic cleaning to remove mill scale and can generally be done during operation. In some instances, an entire system will need to be cleaned and the water will then be sent to the process water pond. The water may then either be used by the steel slag processor for cooling the hot molten slag or reused back in either the non-contact water or the contact water, dependent upon its cleanliness and potential pretreatment required.

Make-up water: This water when needed will come from several ground water wells installed onsite. The level control systems will add water when needed via pumps to the particular water system. However, if at all possible other waters either from the process water pond or contact or non-contact systems may be used prior to using

well water so that recycling may be maximized.

The process water pond will be used, as mentioned above for several purposes. One for cooling the hot molten slag handled by the steel slag processor. Also the water may be pumped back into the process water systems for reuse as needed, again depending upon the cleanliness and potential pretreatment required. This pond may also utilize water from the nearby storm water pond for the steel slag processing area, if water levels in the process water systems and pond are low. This pond may be either earthen or concrete depending on the actual size, dimensions, elevation, etc. This pond may also need maintenance and cleaning from time to time to remove sediment buildup. The material removed will be tested accordingly and determined whether it may be handled and recycled as mill scale or properly handled offsite. Water from this pond may also need to be either land applied or discharged due to very heavy rain events or other potential conditions arising from the operation of the facility. Nucor will continue to evaluate the systems to determine the proper permitting process required for these above actions and will work with the NCDENR so as to have the best system possible.

4.3.4.12 Industrial Waste

KO61 – Electric Arc Furnace Dust: Generated from the primary production of electric arc furnace steel making. Material is captured by a baghouse and conveyed to a silo and then either loaded into trucks or railcars. The material is kept within closed conveyor systems at all times, even during loading. The material is then transported offsite either to a recycler for the recovery of various metals such as zinc, lead and cadmium or may be stabilized and disposed of properly at a regulated disposal facility. If recycled, the metals are then reused to make new products again.

Various Solid Wastes: Includes, but is not limited to cardboard, paper, rubber

(mostly tubing), wood, plastic, fluorescent light bulbs, general cafeteria office refuse, tires, used petroleum products, copper, aluminum, electrical wire, motors, etc. Nucor will establish a system whereby a majority of the above mentioned materials are recycled, if reasonably practicable and economically feasible.

4.3.4.13 Noise

The proposed Nucor Steel mill is designed to minimize noise levels associated with plant operations. The Construction Plan will contain information regarding best technology available and best management practices used to minimize noise levels. The location of the steel mill is approximately in the center of the site to allow for a maximum buffer area. Nucor will also maintain a vegetated 200-foot buffer around the perimeter of the site.

4.3.4.14 Navigation

River barges have utilized the Chowan River for many years to ship industrial goods. The only commercial barge traffic currently operating on the Chowan River is operated by Union Camp Corporation. Union Camp owns a paper mill at Franklin, Virginia on the Black Water River. (The Black Water and Nottoway Rivers come together at approximately the North Carolina/Virginia state boundary and shortly thereafter join with the Meherrin River to form the Chowan River).

The depth of the channel is sufficient to allow river barge traffic to the Nucor steel mill site with no additional dredging. In addition, the depth of the river adjacent to the site is suitable so that <u>no</u> dredging is required to allow the river barges access from the main channel to the dock. Nucor <u>does not have</u> any plans for dredging of the Chowan River. Nucor plans to ship approximately 70 percent (Approximately 840,000 tons annually) of its scrap to this site by barge. Depending on the size of the river barge, one to four barges may arrive a day but should average about 11 barges per week (572 annually). Barge types will be 195 feet long and 35 feet wide or 350

feet long and 40 feet wide. Tugboats will push the smaller barges two at a time. Nucor will ship approximately 2 to 4 barges a week (3000 to 4500 tons) with finished products. The remainder of the barges will leave empty. The Chowan River varies in width along the site boundary from approximately 800 feet wide at the most upstream boundary to approximately 2,000 feet wide on the downstream boundary. The river at the proposed dock location is approximately 1,400 feet wide. Hopper barges will likely be used to bring scrap steel to the Hertford County site. Hopper barges provide containment for the material transported and are also double hulled vessels that will maintain buoyancy with a penetration to its shell plating. Steel scrap will be transloaded to river barges in either Norfolk, Virginia or Morehead City, North Carolina. White Stack Maritime Corporation describes in Appendix F the proposed routes and from Norfolk, Virginia and Morehead City, North Carolina and their suitability for river barge shipping. White Stack Maritime Corporation plans to conduct maintenance and repair activities on the floating equipment at deep-water ports.

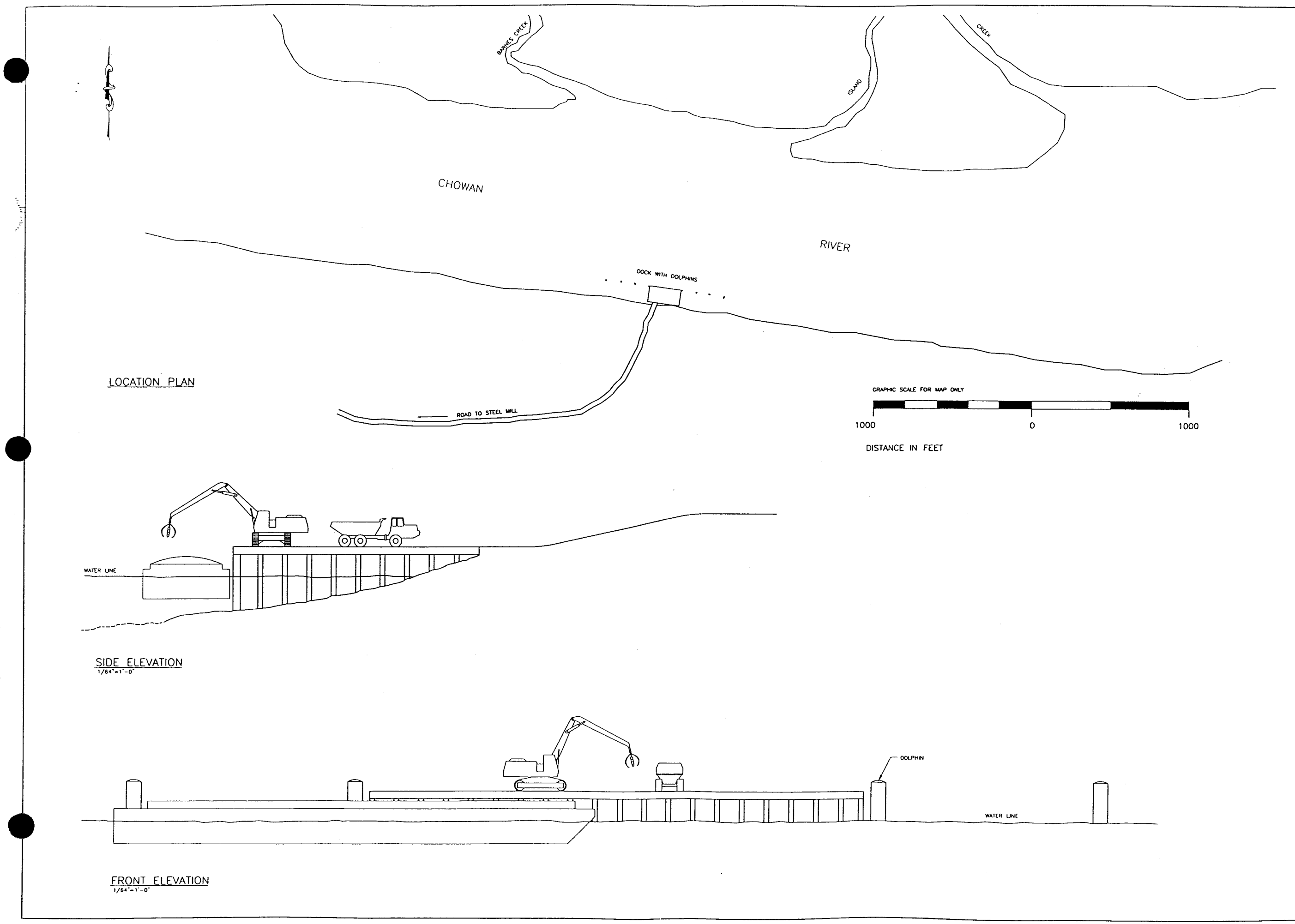
Since 1930, Union Camp has been barging pulp wood from its lumber yards located in Williamston, North Carolina, Edenton, North Carolina and South Mills, North Carolina up the Chowan to its paper mill in Franklin, Virginia. In peak years, Union Camp has averaged five tows per week with four barges and a tug boat in each tow, or an average of twenty barges per week. Available records from the U.S. Army Corps of Engineers, Waterborne Commerce of the United States, show that in 1995 and 1996 there were over 1100 barge trips each year on the river. The preliminary, unadjusted number of total barge trips thus far for 1997 is 528 trips (Waterborne Commerce Statistics Center).

Each barge contains about 425 tons of 16 foot pulp wood, or approximately 1,700 tons per tow. Each barge is approximately 130 feet long, for a barge train (excluding the tug boat) of approximately 520 feet.

Over the past three years, however, the scope of Union Camp's barging operation has diminished as it has averaged only two tows per week of four barges per tow, or an average of eight barges per week. Union Camp has recently made a decision to transport pulp wood to its Franklin paper mill by truck in lieu of barges. Accordingly, by March 31, 1999, Union Camp intends to terminate all barge operations on the Chowan River. This decrease in barge traffic will approximate the increase in barge traffic as a result of Nucor's operation.

4.3.4.15 Dock

Nucor Steel is aware of the productive fisheries within the Chowan River and Albemarle Sound. Construction of the necessary docking facility is being planned around seasonal spawning seasons of the herring and other fisheries so as to avoid and minimize temporary impacts. The preliminary dock design is envisioned as a poured concrete deck on pipe piles measuring 24 inches in diameter. These piles will be spaced on approximately 10 foot centers. This dock does not have obstruction type of foundation and does not have a retaining wall in the river. The piling design of the dock minimizes the impact to the natural flow of the Chowan River. The dock will measure approximately 200 feet by 100 feet and be 12 feet above normal water elevation (Figure 14). Water depth at the face of the dock will be 14 feet deep. Based on preliminary investigations of navigational charts, Nucor believes that the proposed dock is well beyond the setback required for a federal channel and that the dock should not pose any interference with other shipping activities on the Chowan River. A line of mooring dolphins will measure approximately 800 feet from the most upstream dolphin to the most downstream dolphin. The dolphins will be pipe piles measuring 6 feet in diameter. Solar powered lights will mark the most upstream and most downstream dolphins. This dock will support equipment to unload steel scrap from several river barges a day. The width of the dock, 200 feet, will allow the crane to unload the barges without ever swinging its load over open water, thus providing an additional safeguard against falling scrap from reaching the river.



LOCATION PLAN

SIDE ELEVATION
1/64"=1'-0"

FRONT ELEVATION
1/64"=1'-0"

ELLERS, OAKLEY, CHESTER & RIKE, INC.
CONSULTING ENGINEERS

REVISION	DESCRIPTION	BY	DATE
△			
△			
△			
△			

PROJECT TITLE:
DOCKING FACILITY
NUCOR STEEL - TUNIS
Figure 14

DRAWN BY: B. HOLWELL
DESIGNED BY: -
CHECKED BY: -

SHEET TITLE:
LOCATION PLAN & ELEVATIONS

PROJECT NO. 98322
DATE SEPT. 17/98
SCALE AS NOTED

SHEET NUMBER
S1

The dock will be slightly inclined (approximately 1 percent slope) in order to direct stormwater away from the Chowan River to the landside of the dock and into a series of equally spaced drains. This stormwater will be carried from the dock through a series of pipes to a sump where it will be pumped to appropriate stormwater control measures. To prevent scrap material and stormwater from falling into the Chowan River the dock will have reinforced concrete barricades around the dock and along the road from the dock to the shore. There will be a raised section placed on the road that will prevent stormwater from leaving the dock via the road. The stormwater drainage and pumping system will be designed to remove water from the dock at a rate in excess of design storm requirements. In the event of electrical failure during a storm, the curb and wall system around the dock will allow the total volume of the design storm to be contained until pumping is restored.

4.3.4.16 Transloading Sites

Nucor is working with the David J. Joseph Company to find the best site for transloading scrap steel from ocean barges to river barges. This investigation identified numerous facilities in Norfolk, Virginia and Morehead City (Appendix H). While no decision is made on final site selection, the existing dock facilities appear to be adequate for transloading scrap steel. Negotiations are currently underway from all involved to further substantiate the best opportunity available.

4.3.4.17 Marine Fisheries/Herring Fisheries

Research indicates that Herring are present in significant numbers within the Chowan River from February to May. This Herring fishery provides a valuable commercial resource to the fishermen and State of North Carolina. The commercial fishing season for Herring is between January 1 and April 14 while the spawning season is between March and May. The Chowan River also contains American shad, hickory shad, and striped bass all of which are taken commercially and recreationally. Nucor's plans for construction of the dock will avoid the most important periods of time for

these species of fish. Nucor will observe the moratorium on construction in the Chowan River during the spawning season. In addition, the design of the dock will take all practicable measures to avoid disturbance to the fishery. The dock as described above in section 4.3.4.13 is designed on pilings so as to minimize any disturbance to the natural flow of the river. The total area impacted by the 24-inch diameter dock pilings and 6-foot diameter dolphins is approximately 770 square feet.

4.3.4.18 Air Quality

The application for a Prevention of Significant Deterioration (PSD) permit was prepared by Dames and Moore for the Nucor Steel mill and submitted August 25, 1998. The air quality permit applied for by Nucor includes the main mill and slag processing. The U.S. Environmental Protection Agency (USEPA) and North Carolina Division of Environmental Management, Air Quality Section are currently reviewing the permit application. Excerpts from the conclusions of the permit application are provided below.

"A qualitative analysis of the impacts on soil and vegetation associated with the proposed mill has been conducted. Since the maximum predicted ambient pollution concentrations are well below the NAAQS, no measurable air quality impacts on soil and vegetation are anticipated as a result of the proposed mill. Impacts on air quality from general growth associated with the proposed mill are anticipated to increase at a minimal rate."

"Based on the air quality impact analysis, there is sufficient air resource available to accommodate industrial growth in the Hertford County area."

For comparison, expected emissions at the Hertford facility of sulfur dioxide and nitrogen oxide are approximately 1/46 or 2% and 1/5th or 20% respectively of the

emissions released from paper mills.

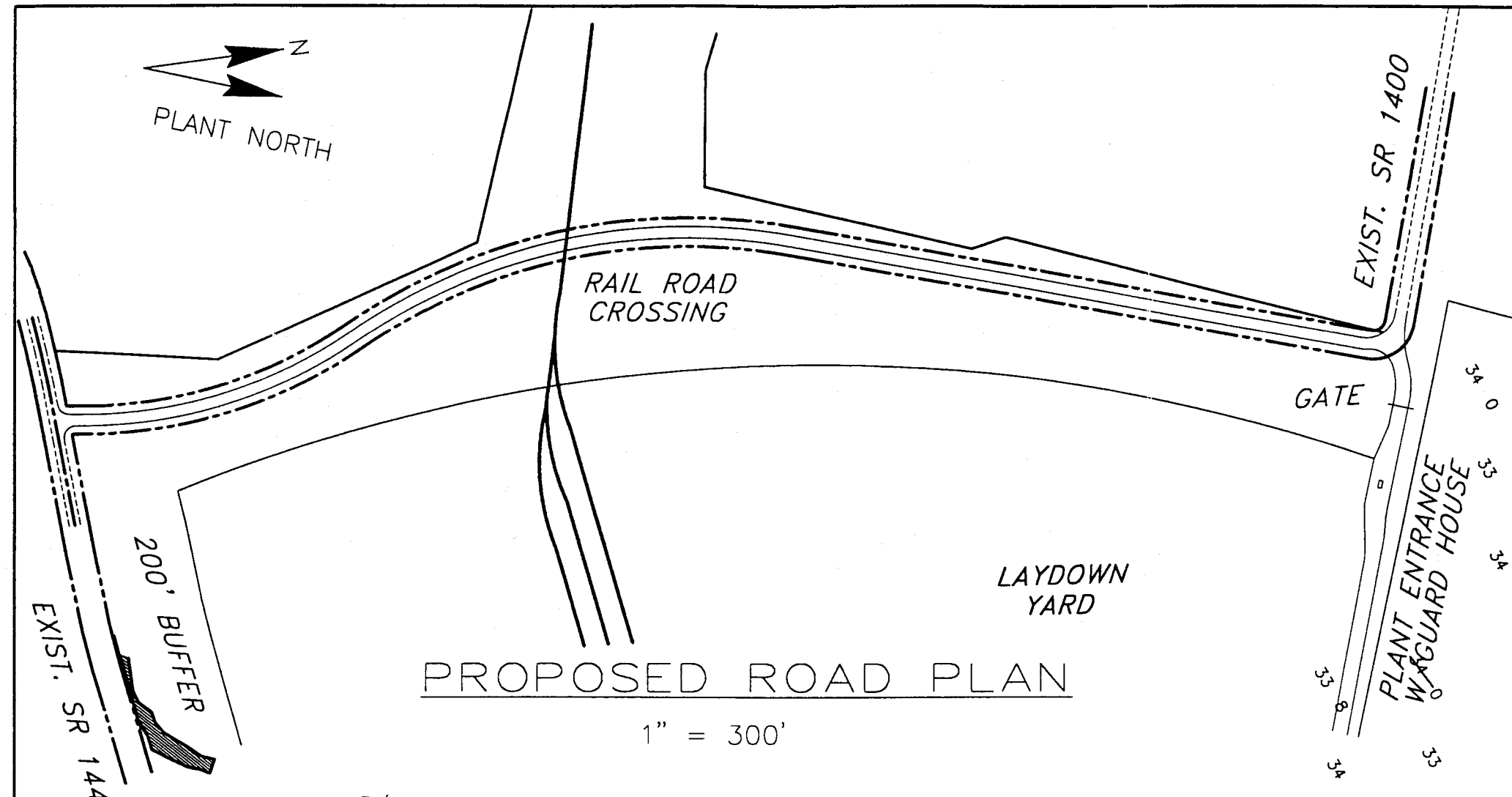
4.3.4.19 Bypass Road

A new road is proposed that connects River Road/State Route 1400 with Bazemore Road/State Route 1445 (Figure 15). This road will route traffic from River Road around the Nucor property to the Bazemore road. This road right-of-way is entirely within Nucor's property boundaries and costs associated with this road will be paid for by Nucor. The new road will then be dedicated for public use. The right-of-way has been surveyed for the federally endangered red-cockaded woodpecker, wetlands, and cultural resources. None of these protected resources are within this right-of-way. The new road right-of-way is approximately 3000 feet long. The proposed road will be designed and constructed in accordance with the North Carolina Department of Transportation's Standards and Specifications.

The road will cross the utility corridor that brings rail, electricity, and natural gas to the Nucor recycling mini mill. The electric lines will cross overhead and the natural gas line will be buried under the road. The proposed road will cross the rail line. This crossing will be designed and constructed in accordance with CSX Transportation, Inc.'s and the North Carolina Department of Transportation's standards and specifications (Figure 16) in order to provide the safest possible crossing.

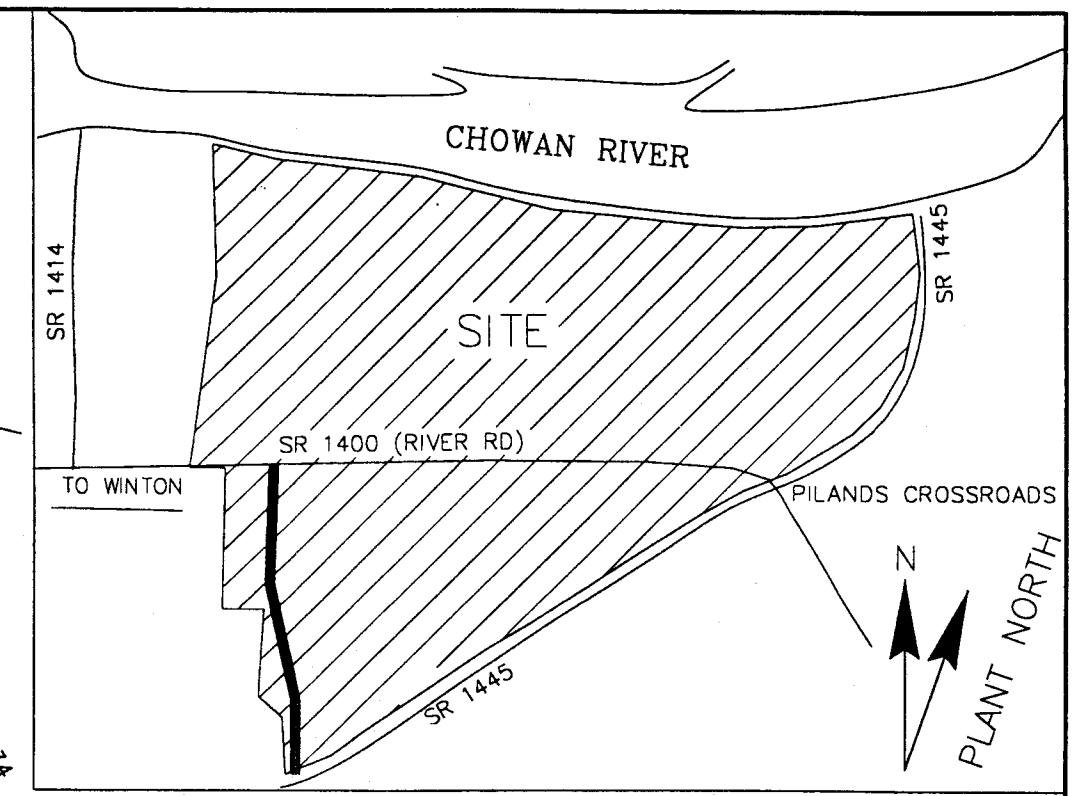
4.3.4.20 Future Growth

Nucor steel anticipates some future growth to occur on-site. Areas planned for future growth facilities are shown on the Figure 10. Although it is practical from an environmental as well as an economic perspective for support industries to be located on site, it is not critical to Nucor's plans for construction of the recycling plant at this location.



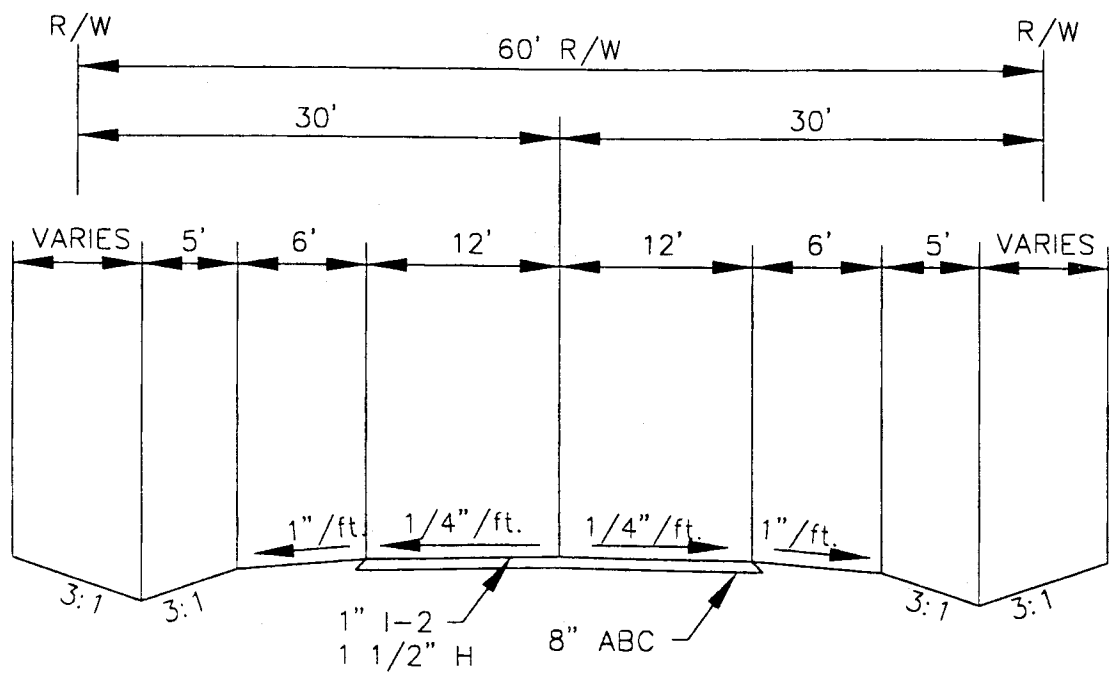
PROPOSED ROAD PLAN

1" = 300'



VICINITY MAP

(NOT TO SCALE)



TYPICAL ROAD SECTION

(NOT TO SCALE)

NOTES :

1. PROPOSED ROAD TO BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S STANDARDS AND SPECIFICATIONS.
2. PROPOSED RAIL ROAD CROSSING TO BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH CSX TRANSPORTATION INC.'S AND THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S STANDARDS AND SPECIFICATIONS.

PROJECT 14300004

McKIM&CREED

ENGINEERS • ARCHITECTS • SURVEYORS

Figure 15

RXR SYMBOL SETBACK FROM STOP BAR	
SPEED LIMIT (MPH)	DISTANCE "A" (FEET)
15	80
20	120
25	160
30	210
35	280
40	350
45	435
50	530
55	650

***STOP BAR LOCATION**

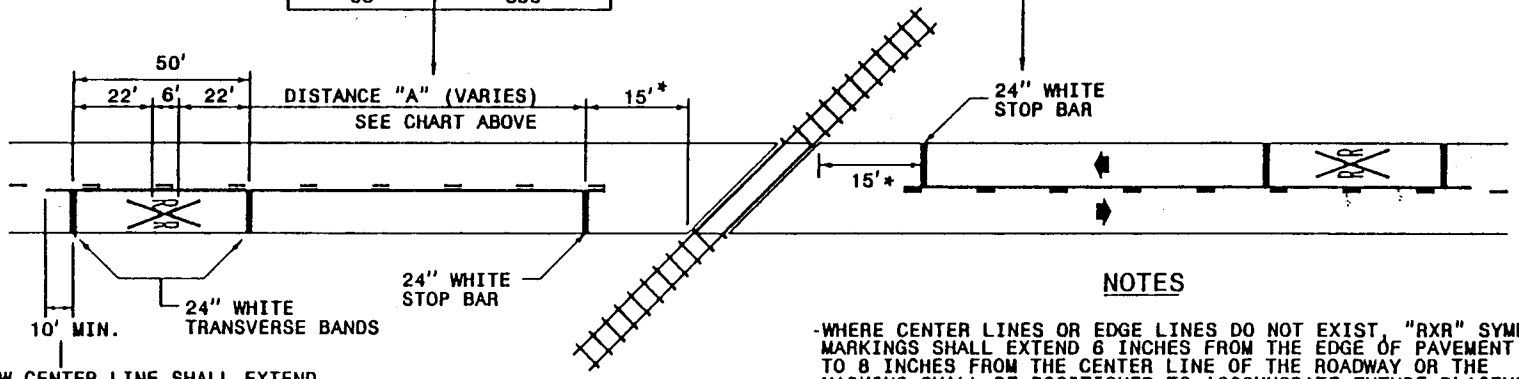
15 FEET IN ADVANCE OF THE NEAR SIDE OF THE TRACK AND PERPENDICULAR TO THE CENTER LINE OF THE ROADWAY.

OR

8 FEET IN ADVANCE OF THE GATE, IF PRESENT, AND PERPENDICULAR TO THE CENTER LINE OF THE ROADWAY.

OR

8 FEET IN ADVANCE OF "RXR" SIGNALS WITHOUT GATES AND PERPENDICULAR TO THE CENTER LINE OF THE ROADWAY.



YELLOW CENTER LINE SHALL EXTEND AT LEAST 10 FT. PAST THE RAILROAD SYMBOL (OR LONGER AS REQUIRED TO MEET SIGHT DISTANCE REQUIREMENTS).

NOTES

- WHERE CENTER LINES OR EDGE LINES DO NOT EXIST, "RXR" SYMBOL MARKINGS SHALL EXTEND 6 INCHES FROM THE EDGE OF PAVEMENT TO 8 INCHES FROM THE CENTER LINE OF THE ROADWAY OR THE MARKING SHALL BE POSITIONED TO ACCOMMODATE FUTURE PLACEMENT OF EDGE LINE AND CENTER LINE PAVEMENT MARKINGS.
- AT LOCATIONS WHERE DISTANCE "A" IS UNATTAINABLE, THE "RXR" SYMBOL SHALL BE LOCATED AT A REASONABLE DISTANCE FROM THE CROSSING, AS DETERMINED BY THE ENGINEER.
- ON MULTILANE ROADS, THE TRANSVERSE BANDS SHALL EXTEND ACROSS ALL APPROACH LANES AND INDIVIDUAL "RXR" SYMBOLS SHALL BE USED IN EACH APPROACH LANE. THE 24 INCH TRANSVERSE BANDS ARE NOT CONSIDERED A PART OF THE "RXR" SYMBOL PAY ITEM.
- FOR ROADWAYS LESS THAN 16 FEET IN WIDTH, THE "RXR" SYMBOL SHALL BE CENTERED ACROSS THE ENTIRE ROADWAY.
- THE DISTANCE "A" FROM THE RAILROAD CROSSING SYMBOL TO THE NEAREST TRACK MAY VARY ACCORDING TO THE SPEED LIMIT, SIGHT DISTANCE OF APPROACHING TRAFFIC, AND PROXIMITY OF THE INTERSECTION. THE ENGINEER WILL DETERMINE THIS DISTANCE FOR ALL CASES.
- REFER TO ROADWAY STANDARD 920.08 FOR SYMBOL LAYOUT.

LEGEND

- DIRECTION OF TRAFFIC FLOW
- PAVEMENT MARKING SYMBOLS
- RAILROAD TRACKS

REVISIONS		
NO.	DATE	DESCRIPTION
	7-20-93	NEW STANDARD

SHEET 1 OF 4

STANDARD PAVEMENT MARKINGS

PAVEMENT MARKINGS AT RAILROAD - HIGHWAY GRADE CROSSINGS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
RALEIGH, N.C.

STD. NO.	REV.
920.11	

FIGURE 16

Future growth includes two different types. First, depending on market demand, Nucor may expand its own operation in the future by adding equipment that will roll thin plates into coils. This expansion is expected to mostly fit inside the existing buildings, however, one additional building of approximately 20,000 square feet may be needed to support this expansion. No additional permits or infrastructural improvements should be needed to accommodate this expansion.

Secondly, future growth is expected to include companies that directly supply or receive goods from Nucor. This may include some of the following companies. Slag processing facility - Slag is a co-product from steel production. Further processing of this co-product produces an aggregate which is used for road construction or other general building purposes. Oxygen Plant - Gases such as oxygen, nitrogen, and argon, are separated for use in steel processing. Fabricators - Steel fabricators may cut, weld or assemble steel for heavy machinery. Steel Service Center - The service center may cut and stock different sizes, grades, and quantities of steel in order to provide steel products for a broad market of small order clients.

5.0 PROJECT DESCRIPTION

5.1 Nucor Steel Recycling Operations

Nucor Steel is a steel scrap recycler and is the largest recycler of any kind in the nation. Steel is recycled more than twice as much as all of the plastic, glass, and aluminum, combined. New technologies allow Nucor Steel mills to be one of the most energy efficient and environmentally friendly steel mills in the world. In addition, the dust generated during melting is captured by a baghouse (i.e.: like a large vacuum cleaner) and sent off-site either to a recycler for extraction of zinc, cadmium, lead or stabilized and disposed of properly to a permitted facility. Mill scale generated during casting/rolling of steel is sent to cement manufacturers as an additive for making cement. Most Nucor facilities have set up a system where a majority of its materials are recycled, such as all

used oils, cardboard, paper, wood pallets, flourescent light bulbs, aluminum, rubber tubing, electric motors and wire and various other solid wastes that would otherwise be destined to landfills.

Raw materials (scrap) will be transported to the facility by river barge (about 75%), rail (20%), and truck, (5%). The proposed mill will utilize a scrap management program to eliminate the purchase of scrap steel that does not meet the required specifications (essentially free from oils, plastics, paper, etc.) . The scrap yard attendant will be responsible for inspecting shipments of scrap to insure that they meet the required specifications. Managing the acquisition of various types of scrap includes sorting by size, type, and density, which allows for more efficient melting.

Different kinds of scrap have different chemistries and densities that must be blended to meet the requirements of the customer. Blended scrap will be placed onto a large conveyor, which conveys the scrap to the DC electric arc furnace (EAF). Here a large electric arc melts the scrap into liquid steel at 3,000 degrees Fahrenheit.

After 165 tons of scrap steel has been melted, the "heat" (liquid steel) is then poured into a large refractory lined bucket or ladle. This is called a "heat" of steel. The ladle is transported to a station where final chemical adjustments are made, this is called the ladle metallurgical facility. When ready, the heat is taken by crane to the continuous caster. At the caster the steel is poured through a mold to continuously cast the slab. Water flows around the copper mold to start solidifying the liquid into solid. The steel continues from the mold like a ribbon. The slab will be 4" to 6" thick, 72" to 123" wide, and 14' - 50' in length. The slabs will then either be placed in inventory or taken through a reheat furnace that brings the temperature throughout the slab up to proper rolling temperature. The slab will then be rolled, through a reversing mill and made into plates. The plates will be rolled in length from 100' to 375' and width from 72" to 123" and thickness from 3/16" to 2". The plates will then be cut to specified lengths and then be stacked into piles and fed to the shipping area by conveyor. Trucks and railcars are loaded using overhead cranes.

Almost all of the supplies and materials used and produced by the mill are recycled. Cooling water is recycled over and over with the need to make up for only the water that is evaporated after coming into contact with hot steel. A large system of cooling towers and process water ponds (Figure 10) are used for this recycling. Potential discharge of this cooling water would only be for periodic cleaning of the system and potentially only a few times a year. According to the allowable permitted guidelines, the cooling water during these few times will either be recycled back to the process, used to cool slag, applied to land or discharged into the river. Any discharge of water used in cooling operations will be released at normal pond water temperatures. There will be NO discharge of thermal water into the Chowan River. The pH of the cooling water will essentially be neutral approximately between 6-8. All other water quality parameters will meet state and federal requirements.

5.2 Construction, Operations, And Environmental Permits/Notices

Nucor Steel is aware of the regulatory compliance required for its intended operation. As a corporate citizen and integral part of the Hertford County community, Nucor Steel intends to comply with all required federal, state and local regulations regarding the construction and operation of the proposed mill. Necessary authorization from the various local, state, and federal agencies will include some or all of the following permits and notifications:

DENR Land Disturbance (SEC) Permit
DENR Stormwater Permit
DOT Certification
Domestic well permit and Ground water withdrawal notice
(Temporary) Septic System Permit
County Building Approval
Burn Permit, as needed
USACE 404 permit
USACE Section 10 Rivers and Harbors Act Permit
401 Water Quality Certification
CAMA Major permit
NPDES Permit
Hertford County Wastewater Approval
Water Treatment Approval
Hazardous Waste Notification/EPA Id No.
Water Recycle Permit

Land Application Permit
Solid Waste permit
Spill Prevention Control Counter Measures Plan
Prevention of Significant Deterioration Air Quality and Title 5 Permit

In addition to compliance with federal, state, and local laws, Nucor has compiled an impressive record of environmental and civic projects that Nucor implemented in and around the communities of their steel recycling mills (Appendix K).

Nucor Steel is also a leading member of the Iron and Steel Committee of the Common Sense Initiative (CSI) Council. CSI is one of EPA's pilot efforts in developing alternative approaches to environmental management and in soliciting early multi-stakeholder involvement in decision making. Nucor's membership with CSI is completely voluntary and another example of the effort Nucor is willing to put forth to protect the environment. A letter dated August 14, 1998 from the administrator of the EPA, Ms. Carol M. Browner, thanks Nucor for their participation in the CSI program (Appendix G) and their efforts to develop a model consolidated, multimedia report for use by a mini mill to report environmental data electronically.

6.0 PUBLIC INTEREST REVIEW

6.1 Potential Impacts and Mitigation

The design and construction of the proposed Nucor Steel plate mill is committed to following a plan that reduces environmental impacts whenever practicable and feasible. Nucor seeks to avoid impacts to the environment where possible, minimize the impacts that are unavoidable by using specific technologies or design changes, and finally to provide reasonable and effective compensatory mitigation to replace resources that are impacted. For example, Nucor proposes to construct the recycling mill in the center of the site to minimize, to the maximum extent possible, potential impacts to adjacent properties from operation of the mill, including noise, visual, traffic and stormwater impacts. This siting of the main facility also minimizes impacts to wetland resources contained within the site and makes the most efficient use of the entire property relative to operations, including: steel

slag processing, oxygen plant, road and railroad access, stormwater ponds, lay down areas, river access, scrap storage areas, utilities and future growth areas. The rail/utility access corridor is located to tie-in to existing rail, natural gas and electrical service and to allow for proper radii, lengths, spacing, et cetera for rail access throughout the facility, including shipping bays, roll shop, consteel, and steel scrap storage. Only three wetland areas will be impacted within the proposed rail/utility access corridor. All rail crossings will be bridged. Temporary construction access roads will be removed upon completion of railroad trestle construction. Natural gas pipelines will be buried, resulting in only temporary impact to wetland resources during the construction process.

For a more complete discussion of the means by which Nucor avoided adverse impacts through site selection see sections 4.1 to 4.3.3 above. For a description of technology and design mitigation measures see sections 4.3.4.5 to 4.3.4.17 and section 5.1 above. The mitigation plan to compensate for unavoidable impacts to wetlands is described in the 404/CAMA/401 joint permit application.

6.2 Economics

In July 1998, North Carolina passed legislation establishing incentives which could attract Nucor as well as other recyclers to economically depressed areas of the state. The presence of Nucor in Hertford County will help establish an industrial base with good paying jobs. Nucor is an egalitarian company. Employees at all levels have the same benefits. There are no executive lunchrooms, executive hunting lodges, or company cars for executives. All employees of Nucor participate in a profit sharing plan, which is fed by 10 percent of the pretax profits. Last year Nucor placed $42 million into the plan for it's 6,600 Employees. Nucor pays a very lucrative production incentive bonus which allows a production employee the ability to double or triple his/her wage. Non production employees are rewarded with a year-end bonus based on the profitability of their division and the company. In addition, every child of every employee is eligible for a college Scholarship of $2,200 per year for up to four years. Last year Nucor invested $1.5 million into the education of employee's children. Spouses of Employees can also qualify for $1,100 per year for education. All employees have excellent health benefits as well.

Professor Stephen Layson, Bryan School of Business and Economics, University of North Carolina at Greensboro, produced a report on the Economic Impact of Nucor Steel Recycling Plant on Northeastern North Carolina (Appendix H). Excerpts of this report are listed below:

- "Nucor will employ 300 persons with total wages of approximately $20 million per year."

- "The average annual economic impact of the Nucor facility over the next 15 years is $398 million per year. Over the next 15 years the cumulative impacts on the region will be nearly $6 billion."

- "The construction and operation of the Nucor facility will generate an annual average of 4,396 new full time jobs both directly and indirectly in related industries. The 4,396 new jobs will generate an additional $118 million in annual income for the household sector."

- "The additional income generated by the Nucor plant will yield extra tax revenue for the state of North Carolina and local governments in the region. Not including State corporate income tax revenue, it is estimated that State tax revenue will increase by more than $7 million per year. Local sales tax revenue within the region is estimated to increase by more than $800 thousand per year."

- "The economic impacts summarized above do not include the effects of other firms that may relocate to the region because of Nucor Steel."

There is support from Federal, State and Local officials and local citizens (Appendix I) for Nucor to locate in Hertford County. The positive impacts created by a Nucor mill are also reflected in letters from the Governor of South Carolina, David Beasley, Mayor of Jewett, Texas, and the Mayor of Blytheville, Arkansas (Appendix I).

6.3 Aesthetics

Nucor is designing the site layout in the best possible way to minimize visual impacts. Nucor is preserving a 200-foot wide buffer of trees around the site. The haul road from the dock to the steel mill is designed with curves eliminating direct site lines to the mill from the Chowan River.

6.4 Secondary and Cumulative Impacts

In commenting on the preliminary application report, N.C. DENR suggested that information relative to potential secondary and cumulative impacts associated with other Nucor recycling mills, be provided as a means of evaluating the potential secondary and cumulative impacts associated with the Tunis site development.

The following section provides information requested by N.C. DENR regarding specific secondary and cumulative impacts associated with other Nucor Steel recycling mills. The scrap steel recycling facilities in Berkeley County, South Carolina and Hickman, Arkansas are relatively new and are used to provide examples of Nucor's mill operations at those locations. The recycling mill proposed for Hertford County has certain similarities in operations to the other mentioned mills, however, the new mill is expected to be smaller in manufacturing capacity and employees than both the Berkeley and Hickman facilities.

Nucor incorporated its own industrial park on the Berkeley County, South Carolina, site in order to create efficiency among related industries. As a result of this on-site industrial park, Nucor has prevented industrial sprawl in the relatively rural area. This same development plan that provides for economic and environmental efficiency is planned for the recycling site in Hertford County. The Nucor mill in Hickman, Arkansas has only a few industries located on-site. As a result most related industries are located off-site in a number of different locations.

6.4.1 Public Road Development

No expansion of road width or increase in road lanes is currently planned along River Road between the Nucor site and the Town of Winton as a result of the Nucor mill locating in

Hertford County. Nucor estimates that daily inbound truck traffic will include 100 trucks arriving for finished product pickup. An additional 10 to 15 trucks will bring scrap steel and other deliveries. Approximate total round trip shipment weight carried by the trucks is 204,000 pounds. Other traffic includes vehicle trips by employees. Nucor employees work in shifts that require employees to arrive and depart throughout the day and evening. Nucor expects the busiest traffic time of day to be between 7:00 and 9:00 a.m with approximately 120 vehicles arriving and 75 vehicles leaving. Other shift changes during the day and evening have approximately 60 to 75 cars entering and leaving.

Nucor chose to build a recycling mill in Berkeley County, South Carolina in 1994. After choosing to locate the steel recycling mill, Nucor requested widening the two lane section of Cainhoy Road (St. Road 98) from Clements Ferry Road to Hagan Avenue, a distance of 5.1 miles. The volume of traffic is not such that a 4-lane road is needed, rather wider lanes were preferred to accommodate trucks for safety precautions. This road also serves truck traffic for the recently expanded Amoco Chemical facility adjacent to the Nucor site.

Other road construction projects not related to the Nucor-Berkeley mill that are within five miles distance of Nucor, include a 3.9 mile section of road for widening and turn lanes between the Mikasa Distribution facility and Cainhoy Road and a 3.2 mile section for road improvements from I-526 westward along Clements Ferry Road. These two projects along Clements Ferry Road are needed to serve traffic that has increased as a result of Interstate 526 Bypass being completed. Since the completion of I-526 numerous companies and industries unrelated to Nucor relocated to this area. Most notably the Mikasa Distribution Center which is now located on Clements Ferry Road.

In Arkansas, no road work was performed as a result of Nucor building its Nucor-Yamato mill. When the second mill was added in Hickman, Arkansas, 5 years later, there was a small stretch of road (approximately 1.5 miles) that was widened. No other road construction or expansion was performed as a result of Nucor.

Other than the 3000' road outlined in Section 4.3.4.19 above, Nucor has not requested nor is it expected that any road widening or road expansion related to the Hertford facility will be required.

6.4.2 Housing and subdivision development

Nucor originally employed 354 people at the Berkeley recycling mill. Approximately 16.67 percent (59 employees) of the original employment were transfers. Information gathered by the Berkeley Chamber of Commerce and the Bureau of Census show that the Nucor employees live in a wide regional area. Table 2 below shows regional population distribution and residential distribution of Nucor employees.

TABLE 2

	1995 Population Distribution	**1995 Population Distribution Percentage**	**Nucor Berkeley Employees**	**Nucor Berkeley Employees Percentage**
Berkeley County	135,337	24.20 %	128	22.86 %
Charleston County	288,300	51.55 %	270	48.22 %
Dorchester County	84,717	15.15 %	88	15.71 %
Georgetown	50890	9.10 %	49	8.75 %
Other	N/A	N/A	25	4.46 %
Total	559,244	100.00 %	560	100.00 %

This information suggests that employees live in a wide variety of areas and distances from the recycling mill. No single subdivision or housing development was identified as being a direct result of the Berkeley Nucor recycling mill. Nucor anticipates that the location of employee residences will vary greatly and be dispersed throughout the regional areas around the proposed recycling mill in Hertford County. Nucor anticipates transferring 15 percent of the total employment from other Nucor recycling mills to the Hertford County recycling mill. Up to an additional 5 percent of employees are expected to be transfers from other

companies.

Nucor originally employed 370 people at the Hickman recycling mill. This mill now employs 441 people. Ten percent of this workforce is transfers from other mills. No single subdivision or housing development was identified as being a direct result of the Nucor recycling mill in Hickman, Arkansas.

6.4.3 Air Quality

Nucor steel has a PSD Air Quality permit for its operations in Berkeley County, South Carolina. This permit also covers emissions from slag processing operations at Charleston Mill Services. There are currently nine additional satellite industries on the Nucor site, of these companies only one, Chrome Deposits, needs an air permit to operate.

Nucor steel has a PSD Air Quality permit for its operations in Hickman Arkansas. The emissions from two companies, Heckett Multiservice and Inorganic recycling of Arkansas, are included in this air permit. Nucor believes that only one company, Huntco, associated with Nucor required a separate air permit. Nearby, the Nucor-Yamato facility is a structural mill that has an PSD Air Quality Permit.

As mentioned Section 4.3.4.18 above, a PSD air quality permit has been applied for at the Hertford facility. Additional satellite facilities that may locate at this facility, should be similar to those at the Berkeley and Hickman facilities in their lack of a requirement for a PSD permit.

6.4.4 Sanitary Wastewater

Sanitary waste water for Nucor on the Berkeley County site is treated by an aboveground aerated package plant. This facility treats sanitary waste for Nucor. This facility operates at approximately 8,000 to 13,000 gallons per day and discharges clean effluent into a process water pond on-site. Treated wastewater discharged from the package plant is sampled

weekly to meet regulatory requirements. Satellite industries located on the Berkeley site each have their own sanitary waste treatment systems.

Sanitary waste water for Nucor on the Hickman site is treated by two package plants. These facilities have a capacity of 30,000 gallons per day. Discharges from the system into the water stream are sampled once per month for compliance with regulatory requirements.

At the Hertford facility, a package plant would be an alternative but access to the town of Winton's sanitary services would be preferred as outlined in Section 4.3.4.10.

6.4.5 Stormwater

The stormwater for the Berkeley mill is handled by a series of 5 ponds. These stormwater ponds regulate water runoff from the Nucor facility, MG Industries, and Scheuck Steel. Water flows from one pond to another and into the last pond which is approximately 20 acres. There is only one stormwater outfall for all five ponds which is sampled weekly to meet regulatory requirements. The ponds are designed to hold water from a ten-year storm event. Other industries located on-site have their own stormwater management systems.

There are no stormwater ponds on the Hickman site. The stormwater for the Hickman mill is handled by a series of ditches that carry water off-site. The Hickman site has a state stormwater permit and has implemented best management practices for stormwater runoff.

The Hertford plant should be similar to the Berkeley plant in its use of stormwater ponds. See Section 4.3.4.8 above.

6.4.6 Process Waste Water

The process water system for Nucor, MG Industries, and Huntco on the Hickman site discharges up to 1.13 million gallons per day from one pond into a grass ditch that runs for several miles before emptying Saint. Francis River. Process water from the mill is processed

through a clarifier and sand filter prior to discharge to the pond. In addition, Huntco maintains a wastewater treatment plant that discharges into Nucor's process water pond. Discharges from the pond are sampled once a week for compliance with regulatory requirements.

There is one process water pond for the Berkeley site. This pond receives process water from both the hot and cold mills, and stormwater runoff from scrap piles. Process water from the hot mill is cleaned by a series of 10 large monomedia pressure filters prior to entering the process pond. Process water from the cold mill is treated chemically to remove metals prior to discharge to the process water pond. From the process water pond, the water is discharged to the Cooper River. The discharge is sampled every week for compliance with regulatory requirements.

See Section 4.3.4.11 above for a description of the Hertford process water system.

6.4.7 Industrial Waste

Steel production at Berkeley produces two hazardous materials, KO61 (Electric Arc Furnace dust) and KO62 (ferrous chloride). Approximately 15,000 tons of KO61 are collected in a vacuum system each year and transported by rail car to Ohio where the material is stabilized to a non-hazardous form and properly disposed according to state and Federal regulations. The percentage of zinc in KO61 from this mill is too low to be recycled. Ferrous chloride is generated during an acid pickling process which removes scale and prepares the steel for final preparation (galvanize, etc.). The used ferrous chloride is collected and processed by recyclers who make ferric chloride, a usable product for waste water industries. Non hazardous material generated at Berkeley included used oil and grease and mill scale which are transported off site to be recycled or disposed of properly.

Steel production at the mill in Hickman also produces two hazardous materials, KO61

(Electric Arc Furnace dust) and KO62 (ferrous chloride). KO61 collected here goes to one of two waste handlers, Inorganic Recycling of Arkansas (IR) or Horsehead Resource Development Company. IR is an on-site independent contractor that processes a portion of the KO61 as a raw ingredient to produce a saleable product. Horsehead Resource Development Company is an off-site contractor that processes KO61 for zinc recovery. KO62 is currently sent off-site as a substitute for ferris chloride used at municipal wastewater treatment plants for control of hydrogen sulfide gas.

6.4.8 Barge, Rail, and Truck Traffic

Scrap material and finished products are delivered and distributed by barge, rail, and trucks at the Berkeley site. There are approximately 75 empty inbound trucks a day that arrive to pick up finished steel coils for delivery. There are approximately 4-5 inbound trucks a day that bring scrap steel. There are approximately 3 inbound trucks a day that make deliveries. Truck transport is usually Monday through Friday.

There are on average 2 inbound ocean barges a week that deliver approximately 10,000 tons of scrap steel. Of the 8 inbound barges per month six of those barges leave empty, the other 2 barges ship approximately 10 percent of the monthly total of finished steel, approximately 10,000 tons of finished steel. In addition, there are between 1 and 2 inbound self-powered vessels that deliver pig iron. Each vessel delivers approximately 25,000 tons of pig iron.

Usually, one train a day delivers to the Berkeley mill around noon. The inbound train delivers seven days a week and usually contains 50 rail cars. Approximately 25 of these rail cars are empty and are used to ship finished steel products. Approximately 15 of these rail cars bring scrap steel to the site and the remaining 10 rail cars deliver products used in steel production. The outbound train departs in the morning and varies in size from 10 to 90 rail cars but on average has 25 railcars with finished steel products.

Scrap material and finished products are delivered and distributed by barge, rail, and trucks at the Hickman site. There are approximately 60 inbound trucks a day and 60 outbound trucks a day at the Nucor recycling mill in Hickman. Approximately half of these trucks are picking up finished products for delivery and the other half is making deliveries.

There are on average 24 barges a week delivering approximately 36,000 tons to the Hickman facility. Eighteen of the barges leave the facility empty. The other six barges carry approximately 9,000 tons of finished product to market.

Approximately 217 railcars per week enter and leave the site at Hickman. 135 of these are empty and provide for outbound deliveries. 75 rail cars bring approximately 6,200 tons per week of scrap to the site and 7 rail cars bring delivery goods. Additionally, there are approximately180 rail cars that ship 14,000 to 15,000 tons per week "locally" to businesses located at Hickman, Arkansas.

7.0 CONCLUSION

Selection of the Tunis Site in Hertford County, North Carolina meets the criteria of water and rail transportation, site size, utility availability and cost, and other economic and operational considerations. Additionally, given that development of this site will result in the least environmental impacts of any of the other sites investigated by Nucor, therefore, this selection is the only practicable alternative consistent with 404 (B) (1) guidelines.

We believe the selection of this site is a responsible choice and represents a proper balance between the environmental, the local communities and the economic benefits afforded the region and Nucor.

APPENDIX A

Board Action Taken
by
Hertford County Commissioners

Hertford County
P.O. Box 116
Winton, N.C. 27986

TELEPHONE
919/358-7805

I, Patricia M. Weaver, Clerk to the Board of Hertford County Commissioners, do hereby certify that the attached is a true and correct copy of the Board Action taken by the Hertford County Commissioners on October 5, 1998.

This the 21st day of October, 1998.

Patricia M. Weaver
Patricia M. Weaver, Clerk to the Board
Hertford County Commissioners

Minutes
Regular Meeting
Hertford County Board of Commissioners
County Commissioners Meeting Room
October 5, 1998
9:00 A.M.

Present: DuPont L. Davis, Ray A. Farmer, Vernice B. Howard, Marshall W. Askew, David L. Shields

Absent: None

Also Present With the Board: Donald C. Craft, County Manager, Charles Revelle, III, County Attorney, Patricia M. Weaver, Clerk to the Board, Robbin Stephenson, Finance Officer.

The meeting was called to order by Vernice B. Howard, Chairwoman.

The invocation for the meeting was provided by Ray A. Farmer, County Commissioner.

Tax Refunds

On a motion by Askew, and seconded by Shields the Board voted unanimously to approve the following tax refund:

Lindsay, Mary Liverman
Route 2 Box 152
Ahoskie, NC 27910

Mary Liverman Lindsay is due a total refund in the amount of $200.00 account #10698 for the 1994-95 tax years. This refund is due because account in question was approved for landfill fee exemption by Ms. Sandy Vick (Sanitation/Rural Collection).

On a motion by Davis, and seconded by Shields the Board voted unanimously to approve the following tax refund:

Lewis, James M.
Route 1 Box 65
Cofield, NC 27922

James M. Lewis is due a total refund in the amount of $95.69 parcel # 6943-04-4384 for the 1994-97 tax years. This refund is due because account in question was approved release/refund of tobacco allotment by Judy Vinson (Tax Assessor).

Roanoke-Chowan Community College

Dr. Harold Mitchell Roanoke-Chowan Community College President presented an update on the new Classroom/Student Support Center. The College had began to incur expenses relative to the design and construction of the building.

Dr. Mitchell shared with the Board the "State of North Carolina Standard Form of Agreement Between Owner and Designer", which outlined the designer's production schedule and schedule of payments to the designer. The Roanoke-Chowan Community College Business Manager had been informed by the Community College Construction Office that the pre-construction costs could be handled by that office until such time as actual constructions begins and until a payment schedule could be developed.

It was anticipated that construction could begin as early as Summer 1999 and the project could be completed in Fall 2000.

The Designers production Schedule is as follows:

Phase	Completion Date
Programming	8-28-98
Schematic Design	11-27-98
Design Development	3-05-99
Working Drawings	6-18-99
Estimate to Bid	8-23-99

Percentage payments upon completion of the phases of work are as follows:

Upon approval of Schematic Design Phase.....15%
Upon approval of design Development Phase.....35%
Upon approval of Working Drawings and Specifications.....65%
Upon Receipt of Bids.....70%
During the Construction Phase, monthly in proportion to the progress of the work, up to and including final inspection and acceptance.....95%
Upon the closing of all construction contracts and the approval of record drawings and final report.....100%

On a motion by Davis and seconded by Askew the Board voted unanimously to accept the recommendation by Dr. Harold Mitchell, President of Roanoke-Chowan Community College, that the pre-construction costs be paid by the Community College Construction Office until such time as actual construction begins and until a payment schedule could be developed, and then to use County General Obligation Bond Money.

On a motion by askew and seconded by shields the Board voted unanimously to recess the regular meeting to go into a scheduled Closed Session as Allowed Under G.S. 143-318.11 (a) (3) to consult with the County Attorney and (6) to discuss a Personnel matter.

Closed Session

(Minutes of Closed Session are on file in the office of the Clerk to the Board.)

Regular Session

Economic Development Commission
On a motion by Askew and seconded by Farmer the Board voted unanimously to authorize Bill Early, EDC Director, on behalf of Hertford County to enter into a lease with Bellcross Beverage for up to 12 months for the use of the Nucor Corporation and other interested parties for storage space and negotiate the terms of these leases.

Social Services-Personnel
On a motion by Shields and seconded by askew, the Board authorized a New Position—A Part-Time Community Social Services Assistant.

Road Signs
On a motion by Askew and seconded by Farmer the Board voted unanimously to contract with Junius B. Russell for Road Sign Maintenance.

On a motion by Farmer and seconded by Askew the Board voted unanimously to adjourn the meeting until 7:00 P.M. tonight at the Hertford County Courthouse in Winton, NC.

Minutes
Regular Meeting
Hertford County Board of Commissioners
Hertford County Courthouse
Winton, North Carolina
Monday, October 5, 1998
7:00 P.M.

Present: DuPont L. Davis, Ray A. Farmer, Vernice B. Howard, Marshall W. Askew, David L. Shields

Absent: None

Also Present With the Board: Donald C. Craft, County Manager, Charles Revelle, III, County Attorney, Patricia M. Weaver, Clerk to the Board, Robbin Stephenson, Finance Officer

The meeting was called to order by Vernice B. Howard, Chairwoman. Ms. Howard informed the Board and public present that the Commissioners regular meeting was adjourned this morning until 7:00 P.M. tonight, and the meeting was now being reconvened. In addition, there had been published a notice of a special meeting at 7:00 P.M., Monday, October 5, 1998 for the purpose of considering and acting upon certain recommendations of the Hertford County Planning Board to amend the zoning map and to amend the text of the zoning ordinance, following the public hearing, as to the following matters:

(1) To rezone the area described below to Heavy Industrial:

A parcel of land west and northwest of SR 1445, known as Castelow Road, bound on the north by the Chowan River. Property bound on the west by Petty Shore Subdivision and lands owned by Hunter Simpson Sharp and identified in Hertford County Land Records as PIN # 6945-05-8843. These properties include PIN # 6945-34-2715, owned by Champion International; PIN # 6945-65-0348, owned by J. D. Flowers; PIN #'s 6945-66-7624 and 6945-56-7560 owned by Beasley Farms; PIN # 6945-66-4728, owned by Clayton Piland; PIN # 6945-66-2591, owned by Wayne Piland, PIN # 6945-66-1147 owned by G. E. Piland.

Area furthermore includes the southern portion of PIN # 6945-34-2715 bound on the south by SR 1445, known as Bazemore Road and bound on the west by PIN # 6945-01-3104, owned by Bennie Castelow and PIN # 6945-01-0280 owned by Ernest & Nelda Castelow. Area continues west to include a portion of 6945-05-8843 south of SR 1400, known as River Road bound on the west by William S. & Peggy Piland. Area continues south & west of PIN # 6935-74-8197 owned by William S. & Peggy Piland and south of SR 1400, River Road, to connect with an existing area currently zoned Heavy Industrial and includes a portion of PIN # 6935-53-1102 & PIN # 6925-84-0535 owned by Union Camp.

The area on the north side of SR 1400 (River Road) is currently zoned Riverside Residential & Camping. The area on the south side of SR 1400 (River Road) is currently zoned Residential Agriculture. The area is more specifically described on a map on file at the offices of the Hertford County Planning Board.

(2) To change the text of the Hertford County Zoning Ordinance, to expand the Permitted Uses in a Heavy Industrial District, by adding the following provisions:

5.05(B)(20) Steel mills, steel or other solid waste recycling facilities, and related loading, unloading, or transportation facilities.

5.05(B)(21) Port facilities, docks, wharves, piers, loading and unloading facilities, cranes and other structures related to commercial or industrial facilities.

5.05(B)(22) Other industrial, manufacturing or commercial uses not otherwise listed in this ordinance.

Charles Revelle, III. County Attorney, informed the Board and citizens present that their purpose for holding this meeting was to consider rezoning a Specific area for Heavy Industrial Use and to consider changing the text of the Zoning Ordinance. He indicated that the Hertford County Planning Board had made findings, and adopted recommendations relative to these issues, on August 31, 1998, for consideration by the Commissioners. The law requires that before adopting the changes, the Board of Commissioners must consider the recommendations of the Planning Board, and hold a public hearing. Mr. Revelle emphasized that this was not just about Nucor Steel; it was to consider the suitability of these changes to the Hertford County ordinance for any heavy industrial use, both as to whether this proposed area to be rezoned was best suited for heavy industrial use, and as to whether the scope of permitted uses in any heavy industrial zone of the County should be expanded. The impetus for this process had been Nucor's stated desire to build a steel recycling and manufacturing facility on part of the proposed site, with expectations of attracting other industry. Mr. Revelle reviewed portions of the zoning ordinance and the Land Use Plan regarding environmental issues. Mr. Revelle also stated that there had been an environmental assessment study done by the Hertford County Board of Commissioners even though the County Zoning Ordinance does not require that this be done. He stated that after considering all information received, and public comments, the Commissioners could make their own findings, and vote, if desired.

On a motion by Davis and seconded by Askew the Board voted unanimously to leave this meeting to go into a scheduled Public Hearing and open the floor for comments.

Minutes
Public Hearing
Hertford County Board of Commissioners
Hertford County Courthouse
Winton, North Carolina
Monday, October 5, 1998
7:00 P.M.

Present: DuPont L. Davis, Ray A. Farmer, Vernice B. Howard, Marshall W. Askew, David L. Shields

Absent: None

Also Present With the Board: Donald C. Craft, County Manager, Charles Revelle, III, County Attorney, Patricia M. Weaver, Clerk to the Board, Robbin Stephenson, Finance Officer

The Public Hearing was called to order by Vernice B. Howard, Chairwoman.

The Purpose of the Public Hearing was advertised as follows:

the purpose of considering and acting upon certain recommendations of the Hertford County Planning Board to amend the zoning map and to amend the text of the zoning ordinance, following the public hearing, as to the following matters:

(1) To rezone the area described below to Heavy Industrial:

A parcel of land west and northwest of SR 1445, known as Castelow Road, bound on the north by the Chowan River. Property bound on the west by Petty Shore Subdivision and lands owned by Hunter Simpson Sharp and identified in Hertford County Land Records as PIN # 6945-05-8843. These properties include PIN # 6945-34-2715, owned by Champion International; PIN # 6945-65-0348, owned by J. D. Flowers; PIN #'s 6945-66-7624 and 6945-56-7560 owned by Beasley Farms; PIN # 6945-66-4728, owned by Clayton Piland; PIN # 6945-66-2591, owned by Wayne Piland, PIN # 6945-66-1147 owned by G. E. Piland.

Area furthermore includes the southern portion of PIN # 6945-34-2715 bound on the south by SR 1445, known as Bazemore Road and bound on the west by PIN # 6945-01-3104, owned by Bennie Castelow and PIN # 6945-01-0280 owned by Ernest & Nelda Castelow. Area continues west to include a portion of 6945-05-8843 south of SR 1400, known as River Road bound on the west by William S. & Peggy Piland. Area continues south & west of PIN # 6935-74-8197 owned by William S. & Peggy Piland and south of SR 1400, River Road, to connect with an existing area currently zoned Heavy Industrial and includes a portion of PIN # 6935-53-1102 & PIN # 6925-84-0535 owned by Union Camp.

The area on the north side of SR 1400 (River Road) is currently zoned Riverside Residential & Camping. The area on the south side of SR 1400 (River Road) is currently zoned Residential Agriculture. The area is more specifically described on a map on file at the offices of the Hertford County Planning Board.

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5.05(B)(21) Port facilities, docks, wharves, piers, loading and unloading facilities, cranes and other structures related to commercial or industrial facilities.

5.05(B)(22) Other industrial, manufacturing or commercial uses not otherwise listed in this ordinance.

Bill Early, EDC Director, shared the proposal that was presented to the Hertford County Planning Board on a map. The site was chosen because of the need to access the Chowan River for transportation. Mr. Early stated that it was wise to expand the existing Heavy Industrial district already located in this area based upon existing natural gas lines and rail service, making the area feasible for expansion of all industrial uses. Also, based on the observations of the area around the Berkley Nucor Plant it would be wise to have residential areas near the plant site, and the land owner in the central area not being rezoned desired to not have the zoning changed. This proposal furthers Hertford County's comprehensive plan for development and is suitable for rezoning.

Charles Pierce, Chairman of the Hertford County Planning Board, stated that the Planning Board recommended that the properties be rezoned and read the following:

(1) To rezone the area described below to Heavy Industrial:

A parcel of land west and northwest of SR 1445, known as Castelow Road, bound on the north by the Chowan River. Property bound on the west by Petty Shore Subdivision and lands owned by Hunter Simpson Sharp and identified in Hertford County Land Records as PIN # 6945-05-8843. These properties include PIN # 6945-34-2715, owned by Champion International; PIN # 6945-65-0348, owned by J. D. Flowers; PIN #'s 6945-66-7624 and 6945-56-7560 owned by Beasley Farms; PIN # 6945-66-4728, owned by Clayton Piland; PIN # 6945-66-2591, owned by Wayne Piland, PIN # 6945-66-1147 owned by G. E. Piland.

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(2) **To change the text of the Hertford County Zoning Ordinance, to expand the Permitted Uses in a Heavy Industrial District, by adding the following provisions:**

5.05(B)(20) Steel mills, steel or other solid waste recycling facilities, and related loading, unloading, or transportation facilities.

5.05(B)(21) Port facilities, docks, wharves, piers, loading and unloading facilities, cranes and other structures related to commercial or industrial facilities.
5.05(B)(22) Other industrial, manufacturing or commercial uses not otherwise listed in this ordinance.

Joseph A. Rutkowski - General Manager for Nucor Corporation stated that Nucor was very excited about coming to Hertford County and hoped to do so. The state of North Carolina, the North Carolina Department of Commerce, the Northeast Partnership, and the Hertford County Industrial Development Commission helped locate a site for them which happens to be a few miles from Winton, on the Chowan River. He stated that Nucor tries to locate all of their sites on water transportational access properties. He also stated that their intention was to build one of the finest recycling plants that they have today right here in Hertford County. They hoped to hire three hundred people directly and several hundred people indirectly. They also hoped to have the finest state of the art equipment. There were some issues that he had shared with the Planning Board on August 31st, and at this time he again reviewed these issues with the County Board of Commissioners as follows: (See Attachment A)

Harlan K. Britt, P.E. – Senior Project Manager for Kimley-Horn & Associates, was retained by Hertford county to do an Environmental Impact Assessment of the proposed Nucor Facility, and presented the following report: (See Attachment B)

Citizens Comments-Began at 7:45 P.M.:

John Ward – Route 1, Box 110B, Cofield, NC. strongly opposed the rezoning on either side of the River Road.

Valerie Hiatt – Winton, NC. was very much in favor of Nucor locating in the county. She informed the Board that her son performed the design work for the Darlington Nucor Plant and he told her that Nucor will do what they say. She lives near Easco Aluminum and said that they were good neighbors. The noise was good noise because it was "It was the sound of people working".

Noel Mitchell – Ahoskie, NC. - Reviewed numerous penalties that had been placed on existing Nucor Plants and strongly objected to Nucor Steel.

Dr. Stanley Lott – President of Chowan College, resident of Murfreesboro, NC, He informed the Board that the people who are opposed to the rezoning of this land have no responsibility to people to attract people to come into this area, but you do.

Dr. Harold Mitchell – President of Roanoke Chowan Community College and a resident of Route 3, Ahoskie, NC, spoke as a citizen, member of the EDC Board and President of RCCC. He discussed opportunities that Industry will bring to the surrounding communities. He stated that communities that are not prospering are the communities that are not accepting new industry.

Ernest Castelow – Rt. 1, Box 115B, Cofield, NC, - He felt that before rezoning takes place there should be an Environmental Impact Study made.

Edward Livingston – 401 Main Street, Winton, NC - stated that he opposed Nucor and that the noise from trucks bother him where he lives.

Livington Ward – A concerned citizen spoke in favor of Nucor locating in Hertford County.

Barbara Earley – Concerned Citizen stated that she adamantly opposed Nucor coming to Hertford County.

Michelle Felton – Winton, NC. – A concerned citizen and a member of the Historic Preservation Commission. She stated that we live in an economically distressed community and that the Courthouse was crowded with our young people. Most young people have left the County taking their talents and skills. She stated that we lack economic influence in Hertford County.

Eunice Castelow – said that she had been a county resident for 48 years and that she strongly opposed messing up a beautiful community like they have now.

Keith Jones – Route 1, Box 112AA, Cofield, NC, - The community had already loss several trees that were supposed to be used as sound barriers and expressed his concern that the Nucor wells if deeper than his well will cause his water table to drop. He made the decision to drive back and forth to Virginia to work and pay taxes in Hertford County for the quietness. He was against the rezoning and wanted an EIS made.

Concern Citizen, Rt. 1, Box 301, Como, NC, - stated that he had to work as a child and didn't get a good education and wanted to see his children go to college. He was in favor of Nucor coming to the county.

Leigh Basnight – A resident of Petty Shores, stated that he was against the land change.

Billy Piland – Route 2, Box 93, Gates, NC, - stated that he request to rezone would be rezoning three sides of his property and opposed the rezoning request without and EIS being done.

Earl Bell – Route 3, Box 176, Ahoskie, NC, - stated that he was totally against the rezoning and questioned how close do you have to live to be safe because he had heard that the plant manager had purchased a home in Edenton, NC.

Tilghman Phelps – Route 1 Box 112, Cofield, NC, - stated that he was an adjacent landowner and asked for a full EIS and opposed the rezoning.

Joe St. John, Rt. 4, Box 8A, Ahoskie, NC, - Stated that he was in favor of the plant locating in the area.

Donna Lowers – Rt. 1, Cofield, NC – she strongly opposed the rezoning and requested that an Environmental Impact Study be made because she had a obligation to her children to have this done for their future.

Troy Godwin, Rt. 1, Cofield, NC, - strongly opposed to Nucor coming to the area. He indicated that Hog Farmers and Hercules had been fined last week.

Patricia Piland – Rt. 2, Box 93A, Gates, NC. – Property owner in Hertford County and a member of the Chowan River Basin Regional Committee. Ms. Piland is currently working towards a graduate degree in Biology and East Carolina University presented a detailed report concerning the soils being unsuitable for development. She concluded by saying that if the Board of Commissioners were good stewards of the earth, they would require an Environmental Impact Study be made.

Byrond Simonds – Route 1 Box 137, Murfreesboro, NC, - informed the Board that he had a Soil Science degree and reviewed the types of soils in the proposed area. He informed the Board that he has lived in the County for 16 years and something needs to be done to keep the young people at home and reduce poverty.

Bennie Castelow – Rt. 1, Box 52D, Gates, NC, - stated that the County Commissioners were getting ready to make a grave mistake and that he had worked for C.F. Industries before they left the area. He stated that it would not be possible for Nucor to pull 1 million gallons of water a day from the ground and it not eventually go into the Chowan River.

Dr. Terry Hall – Chairman of the Economic Development Commission – He stated that all EDC members were concerned about the environment. EDC members are charged with bringing in industry and economic growth to the County. Hertford County ranks 8th on the list of the most economically stressed counties in the state of North Carolina. He also informed the public that 25% of the population of Hertford County lived below poverty level. He stated that Nucor would expand the County's tax base, increase sales tax, bring better highways, and better housing to the area. At this time, Dr. Hall, highlighted contributions that Nucor had made to other communities and urged the Board to support Nucor.

At 9:25 P.M., on a motion by Shields and seconded by Askew the Board voted unanimously to close the Public Hearing and return to regular session.

Regular Session

Vernice B. Howard, Chairwoman, acknowledged that the following items were presented to the Commissioners for review on the morning of October 5, 1998, to be entered into the record on the night of October 5, 1998:

(1) Motion of Findings of Hertford county Planning Board, August 31, 1998.
(2) Motion of recommendation of Hertford County Planning Board, august 31, 1998.
(3) Report of Harlan K. Britt, October 5, 1998.
(4) Letter from Jane Daughtridge to Don Craft, September 30, 1998.
(5) Environmental Assessment letter from Nucor Steel to William Early, August 31, 1998.
(6) Letter from Edythe McKinney to Donald Craft, August 31, 1998.
(7) Letter from mayor of Jewett, Texas to Bill Early, August 26, 1998.
(8) letter from mayor of Blythville, Arkansas to Bill Early, August 27, 1998.
(9) Letter from Governor of South Carolina to Bill Early, August 28, 1998.
(10) Letter from Governor of South Carolina to Bill Early, September 14, 1998.
(11) Economic Impact Statement of Stephen Layson, July 1998.
(12) Nucor Steel "Environmental and Community Relations" document.
(13) Resolution of Murfreesboro Chamber of Commerce, August 31, 1998.
(14) Resolution of Town of Ahoskie, August 25, 1998.
(15) Resolution of Ahoskie Chamber of Commerce, August 18, 1998.

The following documents were presented to the Commissioners at the Public Hearing held the night of October 5, 1998, to be entered into the record and reviewed on the night of October 5, 1998.

(16) Letter from Gloria Baker to Vernice Howard, undated, received on October 5, 1998.
(17) Letter from Richard and Jackie baker to Chairwoman Howard, October 5, 1998.
(18) Resolution of Town of Winton supporting rezoning, October 5, 1998.
(19) Resolution of Town of Winton supporting Nucor Corporation, October 5, 1998.
(20) Nucor Corporation Agency Records of Environmental Violations.

On a motion Shields and seconded by Davis the Board voted unanimously to accept into the record the above named (1) through (15) as presented at the meeting this morning, acknowledging that the Commissioners had reviewed the material.

On a motion by Davis and seconded by Shields the Board voted unanimously to accept into the records the above named items (16) through (20) as presented at the meeting tonight.

Chairwoman Vernice B. Howard stated that there would be Public Hearings held in each stage of the process based on the letter from Edithye McKinney and the report from Harlan K. Britt.

The Board took a recess to review the materials just received.

Upon reconvening the meeting, Commissioner Davis stated that he had reviewed 1, 2, 3, & 4 of the Planning Board Findings and had no problem, but #5 rewording was desired, to prevent leaving the area wide open to any industry.

Mr. Revelle reminded the Board that if they desired to adopt the proposed changes, it was important to make findings to support their position, and the findings needed to reflect the opinions of the Board. The Attorney had prepared some proposed findings earlier, which needed to be reviewed in light of the Planning Board's findings, other information they have received, Public Hearing comments, and other written information received and studied by the Board. The proposed findings were read, and Mr. Revelle indicated that these proposed findings could be accepted, amended, or rejected, to be certain that they accurately stated the opinions of the Board. Charles Revelle, III., County Attorney reviewed the Planning Board Findings as follows: He stated that apparently the 1st four findings, Mr. Davis agrees with, and wishes to adopt as recommended by the Planning Board. At this time he read the findings as stated above, and a possible change to the 5th finding, if the Board did not want to adopt 5.05 (B) (22). In addition, Mr. Revelle read Findings #6 through #10. In addition, an alternative finding to deny rezoning was read by Mr. Revelle.

Commissioner Askew made a motion to adopt Findings #1 through #10 as outlined and read by the County Attorney, and shown on attachment C. Commissioner Davis seconded the motion. Discussion of the proposed findings was held by the Commissioners, acknowledging that they had reviewed the proposals and were in agreement with #1 - #10. The motion was voted on, and carried unanimously.

The following motion was made by Shields and seconded by Davis,

To rezone the area described below to Heavy Industrial:

A parcel of land west and northwest of SR 1445, known as Castelow Road, bound on the north by the Chowan River. Property bound on the west by Petty Shore Subdivision and lands owned by Hunter Simpson Sharp and identified in Hertford County Land Records as PIN # 6945-05-8843. These properties include PIN # 6945-34-2715, owned by Champion International; PIN # 6945-65-0348, owned by J. D. Flowers; PIN#'s 6945-66-7624 and 6945-56-7560 owned by Beasley Farms; PIN # 6945-66-4728, owned by Clayton Piland; PIN # 6945-66-2591, owned by Wayne Piland, PIN # 6945-66-1147 owned by G. E. Piland. **Area furthermore includes the southern portion of PIN # 6945-34-2715 bound on the south by SR 1445, known as Bazemore Road and bound on the west by PIN # 6945-01-3104, owned by Bennie Castelow and PIN # 6945-01-0280 owned by Ernest & Nelda Castelow. Area continues west to include a portion of 6945-05-8843 south of SR 1400, known as River Road bound on the west by William S. & Peggy Piland. Area continues south & west of PIN # 6935-74-8197 owned by William S. & Peggy Piland and south of SR 1400, River Road, to connect with an existing area currently zoned Heavy Industrial and includes a portion of PIN # 6935-53-1102 & PIN # 6925-84-0535 owned by Union Camp.**

The area on the north side of SR 1400 (River Road) is currently zoned Riverside Residential & Camping. The area on the south side of SR 1400 (River Road) is currently zoned Residential Agriculture. The area is more specifically described on a map on file at the offices of the Hertford County Planning Board.

Commissioner Davis said that he wanted to share with the Commissioners pertaining to all the information that he had received. He then began to discuss his four children relocating to other counties in the state as well as to other states to accept employment. They have to travel up and down this road to come home for holidays, and that this was very dangerous. He also stated that as he traveled around this state, sometimes it is embarrassing to give statistics. He stated that the best thing that we can do for our people is to educate them so that they can come back and become productive citizens of our county, and they want to come back. He stated that he realized that anytime there is industrial growth within an area, somebody would have to give up something.

The motion was voted on, and carried unanimously.

A motion was made by Askew and seconded by Shields:

To change the text of the Hertford County Zoning Ordinance.

Chairwoman Howard intervened, and asked Commissioner Askew which section of the text did he want to change and at that time she read the following:

5.05 (B) (20) Steel mills, steel or other solid waste recycling facilities, and related loading, unloading, or transportation facilities.

5.05(B) (21) Port facilities, docks, wharves, piers, loading and unloading facilities, cranes and other structures related to commercial or industrial facilities.

5.05 (B) (22) Other industrial, manufacturing or commercial uses not otherwise listed in this ordinance.

Chairwoman Howard again asked Commissioner Askew which text he wanted to change. At this time, Commissioners Askew withdrew his motion so that he could further study the request from the Planning Board. Commissioner Shields made a motion, seconded by Commissioner Davis, to expand the Permitted uses in a Heavy industrial District by adding the provisions 5.05 (B) (20) and 5.05 (B) (21), and rejecting 5.05 (B) (22), so that the motion would read as follows:

To change the text of the Hertford County Zoning Ordinance, to expand the Permitted Uses in a Heavy Industrial District, by adding the following provisions:

5.05 (B) (20) Steel mills, steel or other solid waste recycling facilities, and related loading, unloading, or transportation facilities.

5.05 (B) (21) Port facilities, docks, wharves, piers, loading and unloading facilities, cranes and other structures related to commercial or industrial facilities.

The motion was voted on, and carried unanimously.

Commissioner Davis stated that when in Raleigh he sees the Governor and he would always ask him "Governor what are you doing for the Eastern part of North Carolina, and sometimes I use slang to the Governor, and I say Governor the Eastern part of North Carolina that you are still Governor of is so dark, sometimes I feel as though you have to pump daylight to us. Now that the Governor has given us something that we don't want, I feel that 75% of the people want this and we are going to do what is best for the majority of the people. We don't want anything illegal but we want progress in Eastern North Carolina. The majority, 75% of the people, want Nucor and we are going to do the will and the pleasure of the majority of the people of Hertford County".

Chairwoman Howard stated that since the first time that there had been any decisions about Nucor, even in her dealings in the County Court System, there had not been one person to come up and talk to her opposing Nucor. She had talked to several people in favor of Nucor. She made a trip to Berkley, she believes from the information that they had received, and all the comments that have been made, that Nucor can do positive things for Hertford County, and she is in favor of them locating here.

On a motion by Askew and seconded by Shields, the Board voted unanimously to adjourn the meeting.

Attachment A--Information shared with the Hertford County Planning Board on August 31, 1998.

Wetlands – we hope to impact less than three acres of wetlands and are working with the State CAMA folks and the Corps of Engineers to delineate these areas. Our dock facility will be built on piers into the river about 100 feet or so and will not require dredging or have an impact on the wetlands. The design will allow for normal river flow so as to not prohibit or disturb fishing.

Air emissions – our air emissions must meet the national and state ambient air quality standards. This means we must control and disperse any emissions so as not to damage the quality of the air we breathe and not have impact on the environment. This is part of the permitting process and is reviewed by the state and the EPA. In general our emissions will be far less than other industries such as a paper mill.

Groundwater – Although we recycle our water many times we do need to make up for the losses from the steam generated in cooling. We expect to use less than 1 million gallons per day of water from deep wells. NC DENR has determined the area is not a capacity use area that this withdrawal should not be a problem.

Potential discharge – Nucor is continuing to work on plans to have no discharge to the Chowan River. We are looking at an engineering solution to this as well as a land application. If these are not possible we will only discharge when cleaning our cooling ponds. Any discharge would have to be permitted by the State and would have to meet the stringent requirements of the Chowan management criteria since it is a nutrient sensitive river.

Noise – Inside our mill will require hearing protection, however outside of our site the noise will be minimal.. We will leave a buffer of pine forest around our site and intend to only use about 200 of the 900+ acres.

Attachment B

Comments To: Hertford County Commissioners

From: Harlan K. Britt, P.E.
Senior Project Manager
Kimley-Horn & Associates
Subject: Rezoning Request
Nucor Steel Corporation
Date: October 5, 1998

The Nucor Steel Corporation is proposing to construct a steel recyling facility in Hertford County, North Carolina. Kimley-Horn & Associates was retained to perform an overview of the environmental issues that will be of concern to Hertford County. A general discussion of that overview follows.

According to Nucor officials, the facility to be constructed in Hertford County, will be very similar to their Darlington, South Carolina facility. Kimley-Horn conducted a close review of the environmental record of the Darlington facility as a means of comparision for the proposed facility. The review consisted of two phases. Initially, we searched for any complaints from those citizens that live adjacent to or in the close proximity to the Darlington facility. Our research did not reveal any complaints from those individuals. The consistant comment discovered was that Nucor was a good corporate citizen.

Secondly, we reviewed the files of the DHEC, the South Carolina environmental regulatory agency, and talked at length to officials that have first hand knowledge of the Darlington plant. The reviews and discussions did not reveal any significant environmental issues in the past five years. However, there were minor environmental situations that had occurred and the DHEC officials indicated that Nucor was outstanding in responding appropriately. DHEC was extremely complimentary regarding Nucor, calling them a model corporate citizen and a leader in South Carolina related to cooperation and communications with the regulatory agencies

In reviewing the DHEC files it was determined that the Darlington Nucor facility does not have any wastewater discharges to surface waters. All wastewater generated at the facility is apparently sent to the Town of Darlington wastewater treatment plant. It is not known at this time whether the Hertford facility will have a wastewater discharge. Should one be

necessary, an NPDES permit for that discharge will be required by the State of North Carolina and an alternative to discharge analysis must be performed as a part of the permit application.

The Chowan River has been designated as nutrient sensitive by the North Carolina Environmental Management Commission and a number of people have expressed concern about the possibility of nitrogen from atmospheric deposition damaging the river. Over the past three years a tremendous amount of research by scientist at NCSU and other universities has been conducted to understand the chemistry and conditions that result in nitrogen being released from the atmosphere to surface waters. The area most studied is the swine industry because of the large amounts of nitrogen in the form of ammonia that is present in those operations. The emissions from the Nucor facility will be entirely different from those of the swine industry. Nitrogen oxide will be produced by the processes in the new facility but this nitrogen compound reacts very differently than ammonia according to state air quality officials. In conversations with the Division of Air Quality, it was their opinion that emissions from this facility will not produce water quality problems in the Chowan River related to atmospheric deposition of nitrogen.

In addition to wastewater discharge permits, construction of the proposed facility will require other additional water quality related permits. Those include soil erosion and sediment control, NPDES stormwater management, 401 Water Quality Certification and CAMA permits for any impacts along the river from the NC DENR. A 404 Dredge and Fill permit from the US Army Corps of Engineers will also be required for the anticipated impacts to wetlands and waters of the US. These permitting activities will be open to the public with one or more public hearings anticipated.

There will be air emissions from the proposed facility that will require approval from the North Carolina Division of Air Quality. Based on the nature and quantity of emissions anticipated from this facility, a PSD and a Title V air permit application must be filed according to Air Quality officals. These air permits will be open to the public and certainly the issue of visibility in relation to Swans Quarters Wildlife Refuge, nitrogen deposition, particulates and other emitted compounds will be throughly reviewed.

One of the ways to determine if harmful air emissions are being emitted from an industrial plant is to inspect the natural vegetation surrounding the facility.

In order to get a better perspective of the impacts that Nucor's air emissions were having on neighboring vegetative communities we decided to talk with a professional forester that had observed the areas surrounding the facility outside Charleston South Carolina. He reported no vegetative damage was noted during his tour of the area. South Carolina officials also stated they had never detected any vegetative damage surrounding the Darlington plant, a further indication of the quality of the air emissions from the Nucor facilities.

The issue of hazardous waste has been raised by a number of concerned citizens and we also made inquiry into that subject with the South Carolina officials. In review of hazardous waste issues at the Darlington facility it was determined that Nucor is not a receptor of hazardous waste. It is anticipated that raw material brought to the Hertford site, like that at the Darlington plant, will not include any hazardous material. The facility will however generate a small amount of hazardous material. The experience and record of existing Nucor facilities indicates they are a very good steward of the materials generated. Because the material generated contains zinc and other materials that have market value, all hazardous material generated is anticipated to be shipped off-site to a proper receiver. South Carolina officials gave Nucor favorable comments regarding their handling of the material generated by Nucor.

Specific discussions about the regulatory relations with Nucor were conducted with DHEC officials. In those discussions, it was discovered that several years ago Nucor established a quarterly environmental conference with DHEC. In these conferences, plant operations and environmental issues are discussed prior to experiencing potential problems. These conferences not only prevented non-compliance issues from occuring but provided the state officials with open communication channels when corrections were necessary. The Nucor management team that established these conferences will reportedly be the new Hertford County facility management and it is anticipated that this proactive approach will be implemented in the new plant.

In conclusion, as a professional engineer with over 28 years experience in environmental management and regulatory affairs, it is my professional opinion that construction of the Nucor Steel facility in Hertford County should not present any significant problems for the environment or for those that live near or work at the facility. The construction will require several

environmental permits from both the North Carolina Department of Environment and Natural Resources and the US Army Corps of Engineers and the permitting process will provide the review necessary to insure the environmentally safe construction and operation of the proposed facility.

Attachment C

FINDINGS OF THE HERTFORD COUNTY BOARD OF COMMISSIONERS - 10/5/98

1. The enlargement of the existing Heavy Industrial District near Tunis would be in furtherance of a comprehensive zoning plan, by extending zoning patterns, with expected extensions of rail and natural gas lines in close proximity, and by provision of some area for residential development near and within proposed industrial sites, with adequate buffer areas provided in the zoning ordinance. This enlargement would also act to enable the promotion of the general welfare of the County by allowing additional areas for industrial expansion and economic opportunity, and support the stated need for economic development, the provisions of additional jobs, and a pro-growth policy.

2. The land proposed to be rezoned for a steel mill and recycling facility, with related transportation loading and unloading facilities including port facilities, is unique in the sense that the proximity of existing rail and natural gas service, coupled with the Chowan River as a means of transportation for raw material to be barged in, and finished product to be barged out and shipped out by rail, therefore making the proposed Heavy Industrial zone extension particularly suitable for heavy industrial use as the most appropriate use of this land. The expectation of extensions of rail and other utilities make the area around the proposed Nucor facility, extending back to the existing Heavy Industrial site, especially suitable for additional Heavy Industrial Development.

3. An environmental assessment letter, dated August 31, 1998, has been provided by Nucor, at this point in time the only identified industrial prospect for location in the proposed rezoning area, and a letter from NCDENR, dated August 31, 1998, outlining the regulatory and permitting process, has been provided, and Mr. Harlan Britt, an independent Environmental Consultant, has outlined at this meeting his views on the proposed Nucor Project. The Hertford County Zoning Ordinance specifies that development in AEC's will be consistent with CAMA guidelines. State law requires that major development projects receive approval of state regulatory agencies for development in AEC. This Board finds, after assessing the information, that there will be minimal impact on fragile areas or AEC's by the currently planned construction of facilities by Nucor, provided that standards and guidelines for development within these areas are enforced by appropriate state and federal regulating agencies, and that this Board has confidence that these agencies, and Nucor, will see that applicable environmental laws and regulations are followed. This approach supports protective measures in AEC's, but encourages resource development activities which can meet standards, State and federal agencies are in a better position to review and monitor environmental impacts than is local government.

4. The nature and activities of steel mills, steel recycling and related facilities seem to be most appropriately located in a Heavy Industrial Zone, given the purposes of the district, and to alleviate any questions as to the permissibility of this use in an IH Zone, it is desirable to include the proposed sections 5.05(B)(20) and 5.05(B)(21) as permitted uses in an IH Zone. It is noted that an IH use must provide a minimum 200 foot setback when abutting a residential district.

5. As it is unknown what specific types of other businesses might wish to locate in an IH Zone, and it is the desire of the County Commissioners to retain some control over potential non-listed uses in the zone, it is more appropriate to have a non-listed use business seek to be included as a permitted use by requesting that the text of the zoning ordinance be amended in each such instance.

   Therefore, we do not consider it appropriate, at this point in time, to include the proposed 5.05(B)(22) as an amendment to the text of the Hertford County Zoning Ordinance.

6. While acknowledging and emphasizing that the primary findings above make the proposed area to be rezoned suitable for any permitted heavy industrial use, questions that have arisen regarding the proposed Nucor Steel project that provided the impetus to an examination of the zoning in this area, cause us also to address and make findings regarding the following issues.

7. Based upon statements made by Bill Early, Harlan Britt, Nucor officials, and our own observations from the site visit to the Berkley Nucor plant, it is advisable to have areas for residential development near the plant site, and the landowner in the central area not being rezoned desired to not have the zoning designation changed.

8. Questions have been asked regarding the consistency of the proposed rezoning in relation to the Hertford County Land Use Plan, as adopted on July 21, 1997. The same individual commissioners who adopted that plan are currently serving as commissioners. As pointed out in a letter dated 9/30/98, from Jane Daughtridge, District Planner for the N.C. Coastal Resources Commission, there is some erroneous language in the Land Use Plan regarding Zoning Ordinance requirements regarding a local environmental assessment (EA) or environmental impact statement (EIS). While a major goal of the Zoning Ordinance is to minimize adverse effects on the environment, there is no requirement of an EA or an EIS in the ordinance, and the provisions of the ordinance control, as the land use plan is merely a general guidance tool. In enacting the 1997 Land Use Plan Update, we did not intend to impose additional environmental assessment requirements on local county actions concerning zoning issues. Statements on pages 52, 56, and 61 of the Land Use Plan that refer to a Zoning Ordinance requirement of filing an EA or EIS are erroneous. In the matter before us, Nucor Steel has, in fact, provided an environmental assessment dated August 31, 1998, Environmental Consultant Harlan Britt has provided an independent environmental assessment dated October 5, 1998. numerous letters from public officials in other states have been received regarding Nucor's environmental record, and three individual commissioners have visited the Berkley, S.C. Nucor site. Therefore, we feel that there

has been a more than adequate assessment and review by us of potential environmental impacts, in fact, more than is required by our ordinances. We find no specific evidence of major environmental problems at Nucor facilities, or other industries surrounding Nucor facilities, and while environmental concerns of citizens are legitimate, after our review of the information in the record, and public comments, we are satisfied that the environmental impact of the proposed rezoning will not be significant, and that the permitting processes required of Nucor, or other industries that might affect Areas of Environmental Concern, by the state and federal governments, as well as regulation and monitoring by government agencies following construction of industrial facilities, will provide necessary environmental protection. We feel that the information provided by Nucor, coupled with other information in the record, is satisfactory to meet all intents and guidelines of the Hertford County Zoning Ordinance and the Hertford County Land Use Plan. The Hertford County Land Use Plan also contains numerous strong pro-growth statements, in the Executive Summary, and on pages 44, 52, 60, and 61.

9. The report of Harlan K. Britt, independent environmental consultant, dated October 5, 1998, provides numerous positive reasons to rezone the area. Mr. Britt's research did not reveal any complaints from citizens living near the Darlington mill, which is similar to the proposed Hertford mill. South Carolina's DHEC regulatory agency reported no significant environmental problems in the past five years, and indicated that Nucor was outstanding in their response and pro-activeness in environmental issues, calling them a model corporate citizen. There was no indication of vegetative damage surrounding either the Darlington or Berkley plants. The report indicates that atmospheric nitrogen oxide emissions should not produce water quality problems for the river, and that both air and water quality permitting processes will insure environmentally safe construction and operation of the proposed facility.

10. Although impact on the natural environment from Nucor and other anticipated industrial facilities will be minimal, impact on the human environment in Hertford County will be most significant, in a positive way, in helping to break the cycle of lack of job opportunities in northeastern North Carolina, as outlined in Professor Layson's July, 1998 Economic Impact Statement.

Attachment D

ALTERNATIVE FINDING TO

DENY REZONING

That the proposed rezoning is not in keeping with the Zoning Ordinance comprehensive plan for development, nor the Hertford County Land Use Plan, in that the proposed industrial expansions are likely to have a major adverse environmental impact, and would result in too much concentrated industrial growth near residential areas and Areas of Environmental Concern.

APPENDIX B

North Carolina Power Company Letter

NORTH CAROLINA POWER

November 11, 1998

Mr. Joseph A. Rutkowski
Vice President and General Manager
Nucor Steel

Re: Construction of Electric Transmission Lines, Nucor Site in Hertford County, NC

Dear Joe:

As you know, North Carolina Power is in the process of route selection and engineering for the 230 kilovolt transmission line that will be required to serve the electric power needs of the proposed Nucor mill in Hertford County, NC. This transmission line will extend for a distance of approximately 5.2 miles from an existing line to the Hertford site. It appears that only 3 miles are outside of the Nucor utility corridor that is being developed by Nucor to consolidate utilities in a common area.

North Carolina Power is extremely sensitive to any potential impacts on the environment that may be caused by the construction of transmission lines. Although final engineering has not been completed that will allow us to determine the exact structure locations, we will make every effort to minimize impacts on wetlands and will approach the construction of the transmission line in the following manner:

1. Minimize routing in wetlands
2. Minimize fill in wetlands
3. When routing in wetland is unavoidable:
   a. Route perpendicular to streams to minimize impact
   b. Span streams (no structures in wetlands, if possible)
   c. Hand clear in wetlands
   d. Use removable mats to bring construction equipment in and out

Typically, there will be no "fill" in wetland areas because the transmission line can span the wetlands. If fill is necessary, it is usually only the foundations for the transmission line structures.

In the past we have received approval from the Corps of Engineers under Nationwides 12, 25, and 26 for construction of transmission lines that cross wetland areas.

Additionally, in a letter dated October 12, 1998, the North Carolina Heritage Program informed us that there are " no records of high quality natural communities, rare species, scenic river, or Significant Natural Heritage Areas in the study site for the proposed transmission line to serve the Nucor Steel plant".

In a letter dated October 28, 1998, the North Carolina Department of Cultural Resources informed us that the study area has some 25 archaeological sites, none of which are considered eligible for inclusion in the National Register of Historic Places and no further work is recommended. They are not aware of any structures with historical or archaeological importance.

I hope this information is helpful to Nucor.

Sincerely,

R. Kent Hill, CED
Regional Economic Development Director

APPENDIX C

Biological Assessment for the Proposed Nucor Steel Plate Mill Site

BIOLOGICAL ASSESSMENT
FOR THE
PROPOSED NUCOR STEEL PLATE MILL SITE
HERTFORD COUNTY, NORTH CAROLINA

Prepared by:
Robert H. Pegram, Jr. and Dr. J.H. Carter III
Dr. J.H. Carter III & Associates, Inc.
Environmental Consultants
P.O. Box 891
Southern Pines, NC 28388

Submitted 28 October 1998
To:
McKim & Creed Engineers, P.A.
243 Front Street
Wilmington, NC 28401

BIOLOGICAL ASSESSMENT
FOR THE
PROPOSED NUCOR STEEL PLATE MILL SITE
HERTFORD COUNTY, NORTH CAROLINA

INTRODUCTION

Nucor Steel Company proposes to build a steel plate mill on an approximately 900 acre site located adjacent to the south side of the Chowan River between Bazemore Road and the Petty Shore community in Hertford County, North Carolina. A 250-foot wide utilities right-of-way easement measuring approximately 2.75 miles long will be located west of the property. This assessment addresses potential impacts of this project on the federally endangered red-cockaded woodpecker (*Picoides borealis*) (RCW) pursuant to Section 7 of the Endangered Species Act (ESA), as amended.

PROJECT AREA

The project area is located in the northeastern portion of Hertford County in the north-central Coastal Plain physiographic province of North Carolina (Figure 1). The area is bordered by the Chowan River and Gates County to the north and east, Bertie County to the south and the Towns of Winton and Ahoskie to the west. The landscape is characterized by pine plantations, oak-pine forests, hardwood bottomland and agriculture, with isolated commercial and residential developments.

The topography in the project area ranges from fairly steep near drainages to nearly flat on uplands. Elevations range from just above Mean Sea Level (MSL) along the Chowan River to approximately 65 feet MSL on uplands. Soils are generally characterized as loams, sandy loams or mucks, with the Leaf-Lenoir-Craven series and Norfolk-Bonneau-Goldsboro series being most widespread on the uplands. The dominant soils in lowlands belong to the Dorovan-Bibb-Wehadkee series. Streams within the project area are part of the Chowan River drainage.

Historic upland vegetative communities are poorly understood due to repeated logging, prolonged fire exclusion and past agricultural conversion. The most widespread pre-settlement

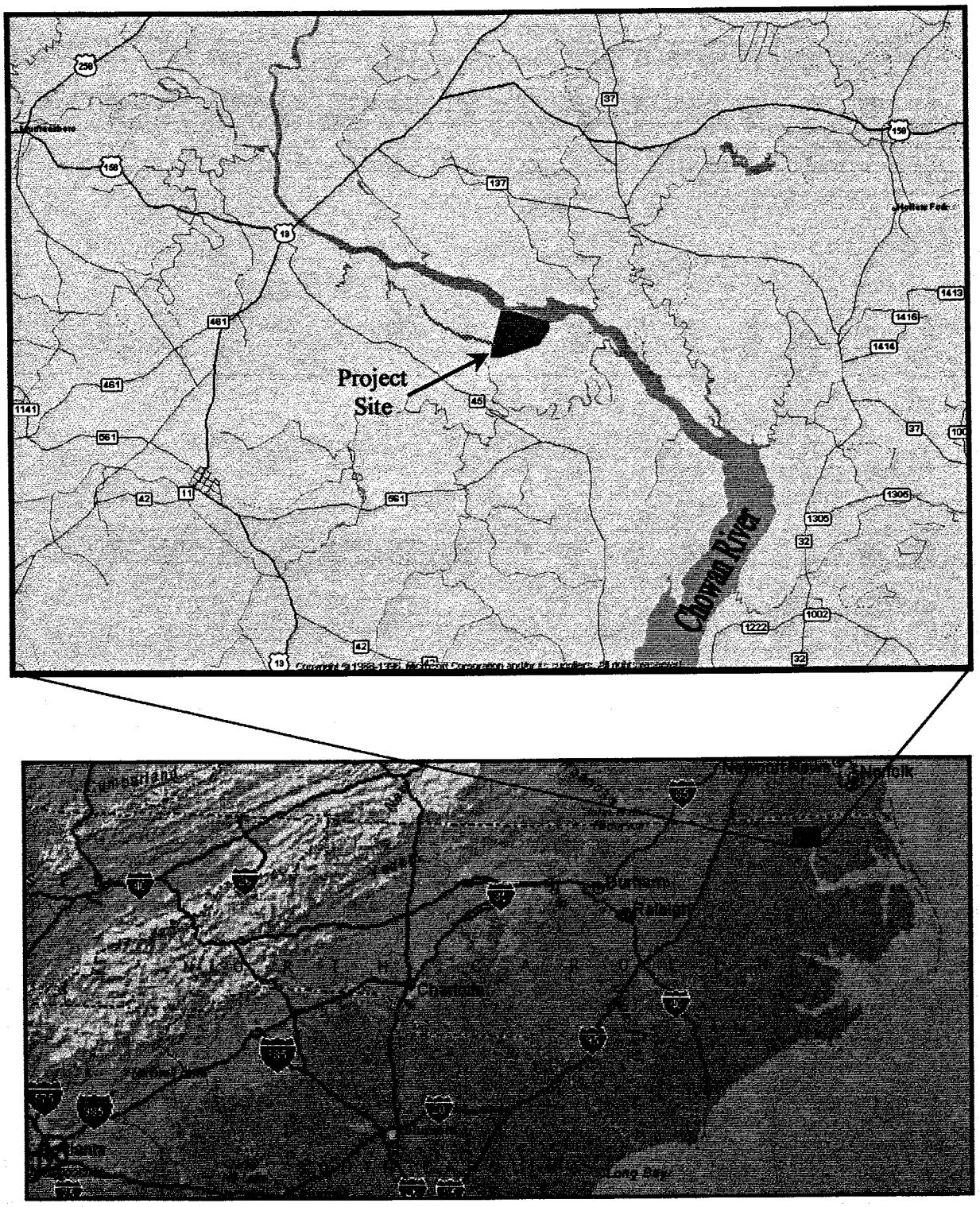

Figure 1. General project area in Hertford County, North Carolina.

upland vegetative community was probably Mesic Pine Flatwoods. Dry-Mesic Oak--Hickory Forest and Dry Oak--Hickory Forest may have occurred on some sites. Mesic Mixed Hardwood Forest- Coastal Plain Subtype occurred on river bluffs and on slopes along some drainages.

Poorly drained flats with hydric soils supported the Wet Pine Flatwoods community type, which was vegetatively similar to Mesic Pine Flatwoods. Cypress--Gum Swamp- Blackwater Subtype occurred along the Chowan River and other major drainages and the Coastal Plain Small Stream Swamp- Blackwater Subtype occurred along small to middle order drainages.

The only indigenous vegetative communities that remain in a relatively natural condition in the immediate project area are in swamps and on bluffs along the Chowan River. Past timber harvesting, site conversions to agriculture and industrial forestry, and prolonged fire exclusion have severely altered most native vegetative communities. Large pine plantations, recent clear-cuts and agricultural fields are the dominant habitat types currently existing. Some dense hardwood and hardwood-pine stands are scattered throughout the project area, though none are extensive or fire maintained.

PROJECT SITE

The majority of the 900 acre project site and associated easement is vegetated with dense loblolly pine plantations (15-40 years old) and a dense hardwood understory/midstory (Figure 2). A portion of the pine plantation on the east side of the property is currently being harvested (thinned). Mature mixed hardwood-pine forest (Dry-Mesic Oak--Hickory Forest) and Mesic Mixed Hardwood Forest are located on the north side of the property parallel to the river, with the latter community being primarily restricted to the bluff along the river. These 2 communities also extend southward into the property along several small drainages. Coastal Plain Small Stream Swamp also occurs in the larger of these drainages. Two private residences and a large agricultural field (planted in soybeans and peanuts) are also located on the property.

Elevations on the project site vary from just above MSL along the Chowan River to approximately 32 feet MSL.

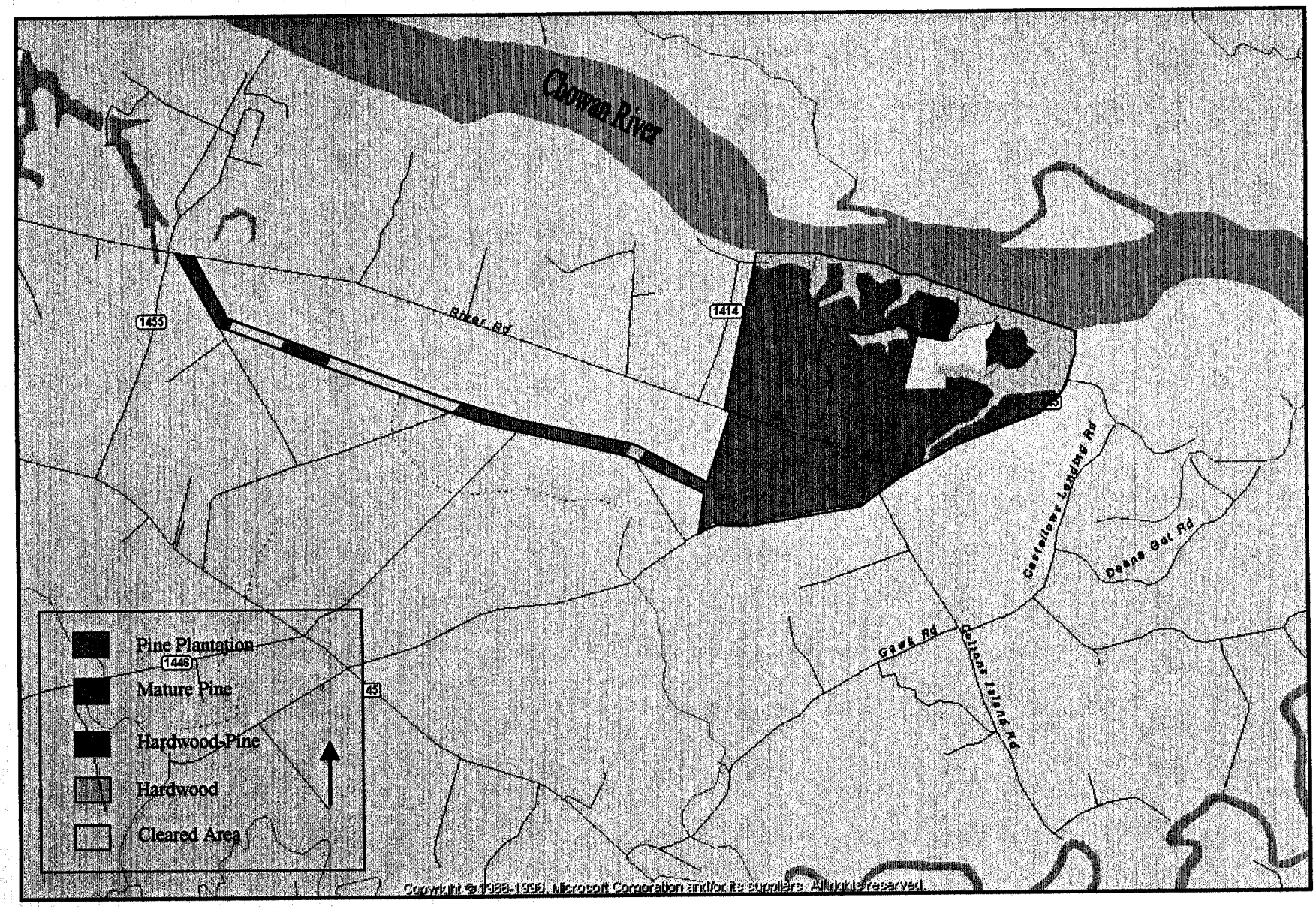

Figure 2. General habitat types on the proposed project site in Hertford County, North Carolina.

PROJECT DESCRIPTION

The project will involve phased construction of a steel plate mill within an approximately 900 acre site located south of, and adjacent to, the Chowan River in Hertford County (Figure 2). The project will include a dock on the river with barge capabilities and a rail system to transport raw and finished steel products to and from the plant. A 250 foot wide utilities easement will extend approximately 2.75 miles to the west (Figure 2). At the time of this assessment, the actual site development plans were incomplete; however, a 200 foot undisturbed buffer will be maintained around the perimeter of the project site.

METHODS

The U.S. Fish and Wildlife Service (USFWS) indicated by form letter dated 16 July 1998 that the RCW was the only species known from the immediate project area that was listed as threatened or endangered pursuant to the ESA, as amended. Since the RCW was the only species of concern identified by the USFWS, terrestrial surveys were limited to this species.

The project site and appropriate habitats within one-half mile of it were surveyed for RCW cavity trees between 21 and 24 September 1998 by biologists familiar with this species, its cavity trees and habitat. Survey methodologies included foot transects spaced 50 to 200 feet apart (depending on the understory density) in stands with mature pines and surveys via vehicle in young pine plantations with spot-checks on foot for old, remnant pines. Aerial photography was also used to search for remnant older pines in even-aged young pine stands. The age of each plantation or stand was determined by coring a representative tree from that stand. RCW habitat was defined as pine or pine-hardwood stands $\geq$ 25 years of age. Potential RCW habitat separated by more than 330 feet of non-habitat was not surveyed. RCW surveys generally followed methods described in the USFWS Blue Book (*Guidelines for preparation of biological assessments and evaluations for the red-cockaded woodpecker*, Henry 1989).

RESULTS AND DISCUSSION

The project site has 4 types of forested habitats: young pine plantation, mature pine forest, mixed hardwood-pine forest and hardwood forest.

Young pine plantations covered most of the project site and were comprised of dense to very dense loblolly pine (*Pinus taeda*) (Figure 2). The plantations ranged in age from 15 to 40 years old, the majority being 20 to 25 years old. A dense hardwood understory/midstory consisting of sweet gum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), white oak (*Quercus alba*), southern red oak (*Quercus falcata*) and tulip poplar (*Liriodendron tulipifera*) was located along the margins of the plantations and in openings in the canopy. The only mature pine trees within these areas were located along the edges of drains or on the plantations' perimeters where they were used as boundary trees. The ground cover within the plantations consisted of muscadine grape (*Vitis rotundifolia*), cow-itch vine (*Campsis radicans*), Japanese honeysuckle *(Lonicera japonica),* switch cane *(Arundinaria tecta),* greenbriers (*Smilax* spp.) and poison ivy (*Rhus radicans*).

A mature (45-65 years old) loblolly pine stand was located just south of Mr. J.D. Flower's home adjacent to an agriculture field (Figure 2). This area was forested with moderately dense loblolly pine with a dense hardwood understory consisting of sweet gum, red maple, southern red oak and white oak. Ground cover consisted of muscadine grape, wisteria (*Wisteria sinensis*) and Japanese honeysuckle.

The mixed hardwood/pine forest was generally located on the upper slopes between the pine plantations and hardwood forest along drains (Figure 2). The hardwood-pine ratio was approximately 70% mature hardwood and 30% mature (50-120+ years old) loblolly pine. Dominant hardwood species in this habitat type included white oak, water oak *(Quercus nigra),* southern red oak, hickories *(Carya* spp.*)*, sweet gum, American beech *(Fagus grandifolia)* and tulip poplar. Understory species included red maple, American holly *(Ilex opaca)*, flowering dogwood *(Cornus florida)*, sourwood *(Oxydendron arboreum)*, Hercules club *(Aralia spinosa)*, strawberry bush *(Euonymus americanus)* and sweet bay *(Magnolia virginiana)*. Ground cover consisted of muscadine grape, greenbriers, poison ivy and partridge berry *(Mitchella repens).*

The hardwood forest was located between the mixed hardwood-pine forest and the Chowan River (Figure 2). No pine trees were located in this habitat. The dominant hardwoods consisted of white and red oaks, tulip poplar, American beech, American holly, water oak and sweet gum. Bald cypress *(Taxodium distichum)* was located along the edge of the Chowan River.

Forested habitat within the one-half mile radius around the project site consisted mainly of dense loblolly pine plantations ≤ 40 years old and dense mixed hardwood-pine stands with mature (> 60 years old) loblolly pine. The plantations contained a dense understory of red maple, sweet gum, American beech, white oak, southern red oak, sourwood, American holly and tulip poplar. Shrubs and groundcover were dense near the plantation edges and sparse in the interior, and included sweet pepperbush (*Clethra alnifolia*), greenbriers, cow-itch vine, switch cane, blueberries (*Vaccinium* spp.) and muscadine grape.

The dense mixed hardwood-pine stands were located south and east of the project site and contained a similar mix of hardwood species as those mentioned above, only older. These stands provided the best possible RCW nesting habitat in the immediate area; however, the dense hardwood component comprised approximately 65% of the canopy and 75% of the sub-canopy. Pines were 60 to 125+ years old with a basal area of 20 to 70 square feet per acre.

An active RCW cluster was reported in 1980 near Cofield, Hertford County (N.C. Natural Heritage Program)(NCNHP), approximately 2 miles southwest of the western terminus of the project site's utilities easement. Also, 3 RCW clusters (2 active) have been documented within the last 5 years in Gates County, north of the Chowan River (Dr. J.H. Carter III and Associates, pers. obser., NCNHP), 7-10 miles northwest of the project site. Other clusters have been reported east of Gatesville and near Merchant's Mill Pond State Park, 5-8 miles northeast of the project site and across the Chowan River (NCNHP).

No RCW cavity trees were found on the project site or within one-half mile of it and no RCWs were seen. The extensive dense pine plantations on most of the project site could provide only submarginal foraging habitat for the RCW. Most pines old enough to contain RCW cavities were limited to occasional boundary and remnant trees in plantations or were imbedded within predominantly hardwood stands. The sole exception was a mature pine stand near the Flowers' home. Overall, RCW habitat quality was poor to nonexistent. The status of the cluster reported in 1980 near Cofield is unknown. The RCW clusters in Gates County are too far away to be affected by this project and the Chowan River forms a major noncontiguous habitat boundary. Based on the above discussion we believe this project will have "no effect" on the RCW.

Current land use conditions and prior habitat disturbances make the occurrence of any other species of concern highly unlikely. The best "natural" habitat on the project site, the Mesic

Mixed Hardwood Forest on the bluff along the river, will be mostly protected within a 200 foot undisturbed buffer, except for an access way to the dock.

CONCLUSIONS

We conclude that the proposed Nucor Steel Plate Mill in Hertford County, North Carolina will have "no effect" on the endangered red-cockaded woodpecker pursuant to Section 7 of the Endangered Species Act, as amended.

APPENDIX D

Cultural Resources Report

Cultural Resources Survey of NUCOR Steel Company's Proposed Plant Site Hertford County, North Carolina

Draft Report

Brockington and Associates, Inc.
Atlanta Memphis Charleston

1998

Cultural Resources Survey of NUCOR Steel Company's Proposed Plant Site Hertford County, North Carolina

Draft Report

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Management Summary

Brockington and Associates, Inc. conducted an archaeological survey of an approximately 990± acre tract (400± ha) including a 2.7 mile (4.4 km) rail access corridor in Hertford County, North Carolina 19 August - 1 September 1998. Field investigations involved the excavation of shovel tests on a 100 ft (30 m) grid in high potential areas and on a 200 ft (60 m) grid in low potential areas to locate archaeological sites; a remote sensing survey of the Chowan River adjacent to the project tract was conducted by Mid-Atlantic Technology and Environmental Research, Inc. This survey provides compliance with federal and state regulations concerning the management of cultural resources in the coastal zone of North Carolina.

NUCOR Steel Company is proposing to build a plate mill on the west bank of the Chowan River approximately 7.4 miles (11.8 km) below the City of Winton. The project tract, including the rail access corridor, currently is covered in planted pines with a few agricultural fields and modern residences interspersed among the woodlands. None of the residences predate 1950. The project tract displays severe disturbance due to intensive silviculture, agriculture, and associated erosion.

Twelve archaeological sites (31HF11, 31HF26, and 31HF215-31HF224), 18 isolated finds (31HF225-31HF236 and 31HF238-31HF243**), and three magnetic anomalies in the Chowan River (Chowan A, B, and C) were located during this survey. With the exception of 31HF223 and one magnetic anomaly (Chowan A), these sites, isolated finds, and magnetic anomalies are recommended not eligible for the National Register of Historic Places (NRHP). No further work is recommended for these 11 sites, 18 isolated finds, and two magnetic anomalies. Site 31HF223 may contain intact cultural deposits capable of producing archaeological information that can address important research questions concerning the prehistory of the region. Site 31HF223 is recommended potentially eligible for the NRHP and should be protected from land disturbing activities until formal testing can determine this site's NRHP eligibility. Magnetic anomaly Chowan A may represent a former river craft; this location should be avoided until additional archaeological investigations are conducted to determine the nature of this anomaly.

Terrestrial archaeological sites and isolated finds in the project tract are located along the bluff of the Chowan River and along small unnamed tributaries that dissect this bluff. These sites and isolates contain artifacts representing eight Early Woodland (Deep Creek) components, five Middle Woodland (four Mt. Pleasant and one Hanover) components, two Late Woodland (one

Colington and one Cashie) components, and five Historic (three nineteenth/twentieth and two unknown) components; 18 unknown Woodland components also are present. Most of the artifacts recovered from the sites in the project tract are small and eroded, probably as a result of modern silvicultural and agricultural practices. Plowing and bedding of the upper 1-3 ft (0.3-0.9 m) of soil deposits on the project tract was noted in most areas. Only 31HF223 appears to contain possibly undisturbed cultural deposits related to the Early and Late Woodland Periods.

Acknowledgments

The author would like to thank Elizabeth Kountis of McKim and Creed for her assistance during this project. The field crew consisted of Scott Wolf, David Lineberry, Steve Roberts, Angus Sawyer, and Dave Baluha under the direction of Todd McMakin. Ralph Bailey conducted the majority of the background research, including visits to Raleigh and Hertford County prior to the initiation of the field investigations. Nicole Huchet completed the laboratory analysis of the recovered artifacts and Carol Poplin produced the report graphics. Jeff Gardner provided valuable editorial assistance.

Forward

This report was assembled by the four authors with initial editing and revisions completed by the Principal Investigator. Individual contributions include:

Chapter I	Introduction	Eric Poplin
	Methods of Investigation	Todd McMakin and Eric Poplin
Chapter II	Natural and Cultural Setting	Eric Poplin and Bruce Harvey
Chapter III	Results of the Investigations	Scott Wolf and Eric Poplin
Chapter IV	Summary/Management Recommendations	Eric Poplin

However, any omissions or errors are the responsibility of the Principal Investigator.

ECP 11 November 1998

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Chapter I. Introduction and Methods of Investigation

Introduction

Brockington and Associates, Inc. and Mid-Atlantic Technology and Environmental Research, Inc. conducted a cultural resources survey of a proposed NUCOR Steel Company plate mill tract and associated infrastructure corridor, 19 August - 1 September 1998. The survey included systematic examination of the terrestrial portions of the project tract and a remote sensing survey of the adjacent portions of the Chowan River. This survey provides compliance with federal and state regulations concerning the management of cultural resources in the coastal zone of North Carolina. These regulations include:

Section 404 of the Clean Water Act of 1948 [33 USC 1344], as amended,

Section 106 of the National Historic Preservation Act of 1966 [16 USC 470], as amended,

Coastal Zone Management Act of 1972 [16 USC 1451 et seq.], as amended, and

Coastal Area Management Act of 1979 [North Carolina General Statutes 113].

NUCOR Steel Company proposes to construct a plate mill on a 990± acre (400 ha) tract located in east central Hertford County, North Carolina. The tract includes a 900± acre (364 ha) parcel located on a high bluff on the west bank (ascending) of the Chowan River, approximately 7.4 miles (11.8 km) below the City of Winton, and adjacent portions of the Chowan River bottom where dock facilities are planned. Figure 1 displays the location of the project tract. The project tract also includes a 90± acre (36 ha)) rail access corridor that extends westward approximately 2.7 miles (4.4 km) to an existing utilities easement (see Figure 1). The majority of the terrestrial portions of the project tract are covered in planted pines with a few modern residential lots and agricultural fields interspersed with the wooded areas.

Intensive survey of the project tract and the Chowan River identified 12 archaeological sites (31HF11, 31HF26, and 31HF215-31HF224), 18 isolated finds of archaeological materials (31HF225-31HF236 and 38HF238-31HF243**), and three magnetic anomalies in the Chowan River (Chowan A-C). Table 1 summarizes the resources encountered during the survey. Eleven sites, 18

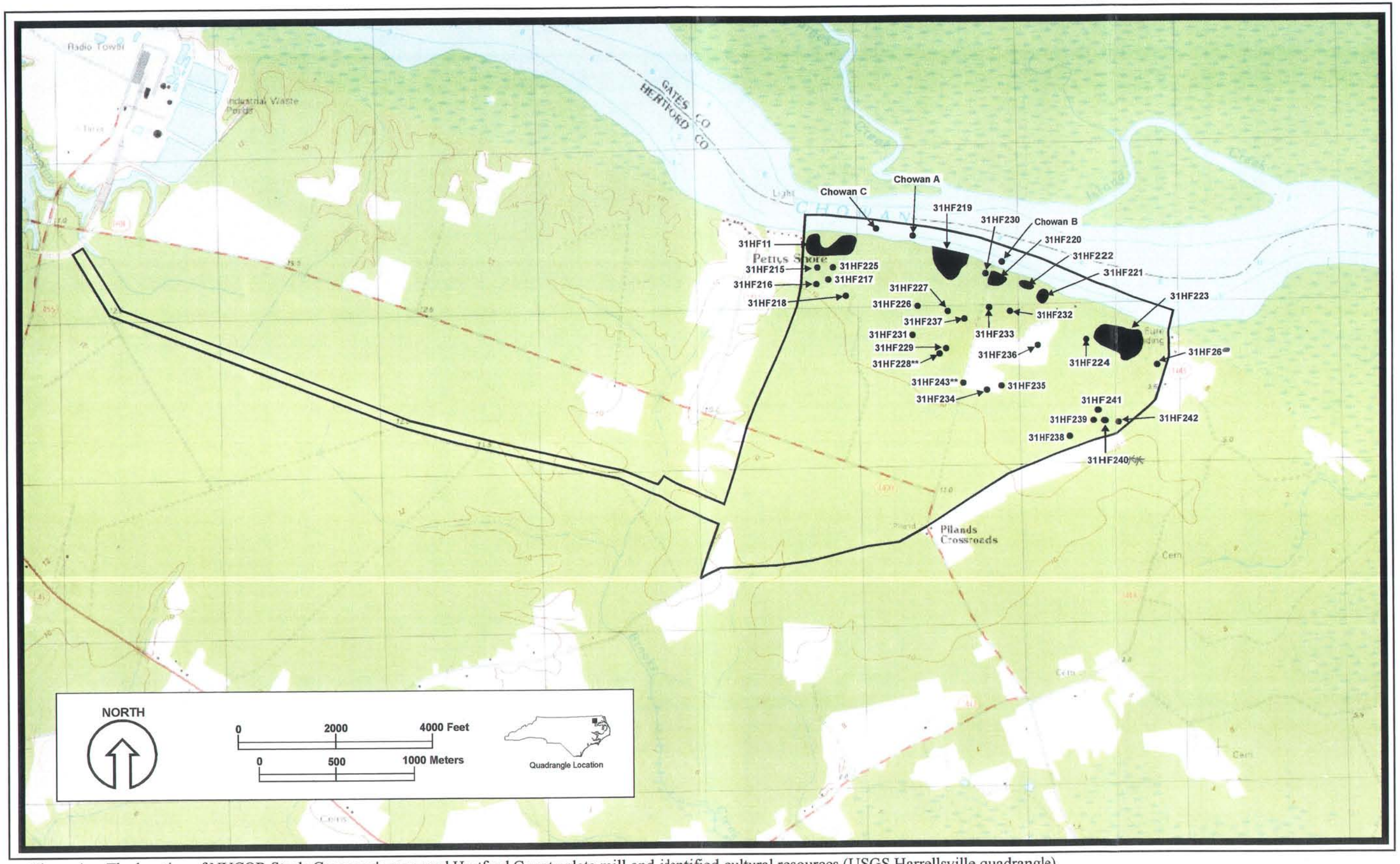

Figure 1. The location of NUCOR Steels Company's proposed Hertford County plate mill and identified cultural resources (USGS Harrellsville quadrangle).

Table 1. Cultural Resources Identified at NUCOR Steel Company's Proposed Hertford County Plate Mill Tract.

Resource	Type / Components	NRHP Status	Management Actions
31HF11	Site- prehistoric ceramic/lithic scatter, historic button / Early, Middle, and Late Woodland, unknown historic	Not eligible	no further work
31HF26	Site-prehistoric ceramic/lithic scatter / Early Woodland	Not eligible	no further work
31HF215	Site-prehistoric ceramic/lithic scatter / unknown Woodland	Not eligible	no further work
31HF216	Site-prehistoric ceramic/lithic scatter / unknown Woodland	Not eligible	no further work
31HF217	Site-prehistoric ceramic/lithic scatter / unknown Woodland	Not eligible	no further work
31HF218	Site-prehistoric ceramic/lithic scatter, historic nail / Early Woodland, unknown historic	Not eligible	no further work
31HF219	Site-prehistoric ceramic/lithic scatter / Early and Middle Woodland	Not eligible	no further work
31HF220	Site-prehistoric ceramic/lithic scatter / Early Woodland	Not eligible	no further work
31HF221	Site-prehistoric ceramic/lithic scatter / Early and Middle Woodland	Not eligible	no further work
31HF222	Site-prehistoric ceramic/lithic scatter / unknown Woodland	Not eligible	no further work
31HF223	**Site-prehistoric ceramic/lithic scatter / Early and Late Woodland**	**Potentially eligible**	**Preserve or test**
31HF224	Site-prehistoric ceramic/lithic scatter / unknown Woodland	Not eligible	no further work
31HF225	Isolated find- prehistoric sherd / unknown Woodland	Not eligible	no further work
31HF226	Isolated find- prehistoric sherd / unknown Woodland	Not eligible	no further work
31HF227	Isolated find- prehistoric sherd / unknown Woodland	Not eligible	no further work
31HF228**	Isolated find- prehistoric lithic, historic glass and brick / unknown prehistoric, nineteenth-twentieth century	Not eligible	no further work
31HF229	Isolated find- prehistoric sherd and lithic / unknown Woodland	Not eligible	no further work
31HF230	Isolated find- prehistoric sherds / unknown Woodland	Not eligible	no further work
31HF231	Isolated find- Roanoke projectile point / Early-Middle Woodland	Not eligible	no further work
31HF232	Isolated find- prehistoric sherd / unknown Woodland	Not eligible	no further work
31HF233	Isolated find- prehistoric sherd / unknown Woodland	Not eligible	no further work
31HF234	Isolated find- prehistoric sherd / unknown Woodland	Not eligible	no further work
31HF235	Isolated find- prehistoric sherd and lithic / unknown Woodland	Not eligible	no further work
31HF236	Isolated find- prehistoric sherds and lithic / unknown Woodland	Not eligible	no further work
31HF238	Isolated find- prehistoric sherds and lithic / unknown Woodland	Not eligible	no further work
31HF239	Isolated find- prehistoric sherds and lithic / unknown Woodland	Not eligible	no further work
31HF240**	Isolated find- whiteware sherd / nineteenth-twentieth century	Not eligible	no further work
31HF241	Isolated find- prehistoric sherds / Early and Middle Woodland	Not eligible	no further work
31HF242	Isolated find- prehistoric sherd / unkown Woodland	Not eligible	no further work
31HF243**	Isolated find- historic sherds and brick / nineteenth-twentieth century	Not eligible	no further work
Chowan A	**Magnetic anomaly- possible vessel / unknown historic**	**Potentially eligible**	**Avoid or assess**
Chowan B	Magnetic anomaly- small signature / unknown historic	Not eligible	no further work
Chowan C	Magnetic anomaly- small signature / unknown historic	Not eligible	no further work

isolated finds, and two magnetic anomalies (Chowan B and Chowan C) are recommended not eligible for the National Register of Historic Places (NRHP). Site 31HF223 and magnetic anomaly

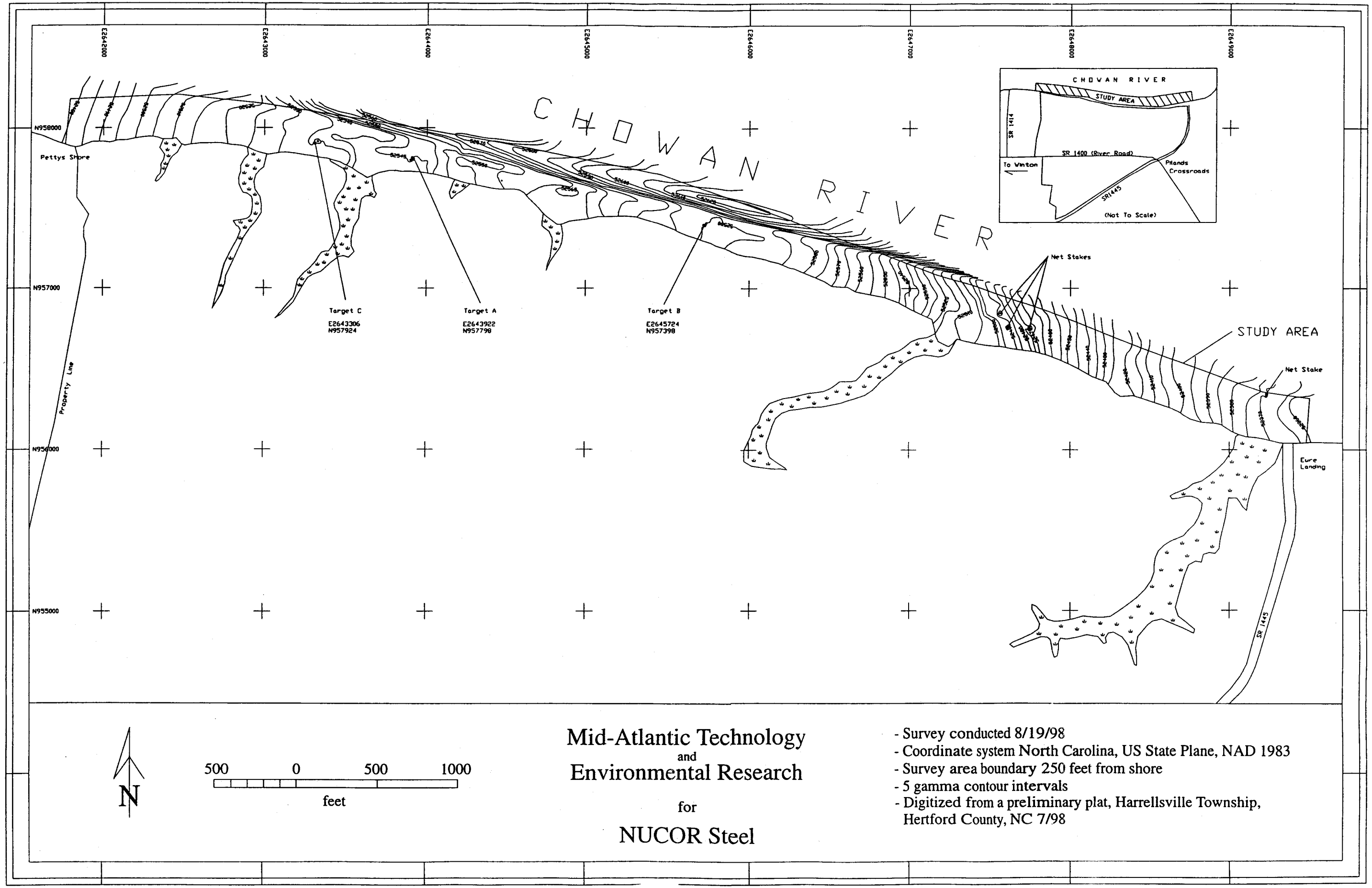

Figure A-2. Magnetic contour and target location map.

Chowan A are recommended potentially eligible for the NRHP. These resources should be protected from disturbances associated with the proposed development of the project tract until their definitive NRHP status has been determined.

The remaining sections of Chapter I present the methods employed during background research, field investigations, and laboratory analyses, and a discussion of the assessment of NRHP eligibility of the terrestrial archaeological resources. The natural and cultural setting of the project area are summarized in Chapter II. Chapter III presents detailed descriptions of the archaeological resources identified in the project tract. A summary of management recommendations for all resources is presented in Chapter IV. Appendix A contains a detailed description of the underwater investigations. Appendix B contains the inventory of artifacts recovered from all terrestrial resources in the project tract. Scopes of work for the terrestrial and underwater investigations are included as Appendix C.

Methods of Investigation

This cultural resources survey was designed to locate and assess any cultural resources located on the project tract, including the 900± acre (364± ha) plant site, the 90± acre (36± ha) rail corridor, and the adjacent Chowan River bank line. Tasks performed to complete these goals included background research, field investigations, laboratory analysis, and the assessment of the NRHP eligibility of all identified cultural resources. Methods employed for each activity are described below.

Background Research

Prior to initiation of any field investigations, background research concerning the project tract, Hertford County, and the Chowan River Valley was conducted. This research involved review of the listings of known archaeological sites and reports of previous cultural resources investigations at the North Carolina Office of the State Archaeologist, review of the listings of NRHP properties at the North Carolina State Historic Preservation Office, review of primary and secondary records in the North Carolina Division of Archives and History, and review of records of land ownership in Hertford County. This research also included a visit to the project tract to determine if potentially historic structures or landscapes were present that could require survey and evaluation. Reputable collectors of artifacts in the project area also were contacted to determine if they had knowledge of

any unrecorded sites in the project tract. This research and brief reconnaissance was conducted by Ralph Bailey, 10-14 August 1998.

Results of this research were provided to the Field Director and to Mid-Atlantic Technology and Environmental Research, Inc. prior to initiation of the field investigations. This ensured that field crews were aware of the locations of any known or potential archaeological or historic sites in or near the project tract.

Additional research of secondary sources was conducted in Charleston, South Carolina, and Savannah, Georgia by Ralph Bailey and Bruce Harvey, Project Historian. This involved the review of the *Official Records of the War of the Rebellion*, land ownership records of Union Camp Corporation, and other general sources of information concerning the history of northeastern North Carolina and Hertford County. Background research required approximately seven person-days to complete.

Field Investigations

Terrestrial Survey. Field investigations in the terrestrial portions of the project tract were outlined in a Scope of Work submitted to the North Carolina State Historic Preservation Officer (SHPO) and the North Carolina Office of the State Archaeologist (NCOSA) prior to the initiation of any field work; a separate scope of work was developed for the underwater investigations (see Appendix C). The terrestrial Scope of Work separated the tract into areas possessing high or low potential to contain archaeological sites. Areas of high potential included lands located within 1,000 ft (300 m) of the Chowan River, lands within 300 ft (100 m) of the unnamed tributaries that dissect the northern portion of the tract, and the entire proposed rail access corridor. The remainder of the project tract was defined as an area of low potential. Figure 2 displays the location of high and low potential areas within the project tract.

This dichotomy was based on previous research in other portions of the Coastal Plains of North Carolina and South Carolina. Numerous researchers in the region (e.g., Hay et al. 1982; Eubanks et al. 1993; Eubanks and Poplin 1994; Hill et al. 1994; Poplin et al. 1992; Rust and Poplin 1995; South and Hartley 1985) have employed soil conditions, topographic settings, and proximity to water sources as factors that influenced the use of the landscape during the prehistoric and historic past. The results of past investigations suggested that areas adjacent to the Chowan River and any

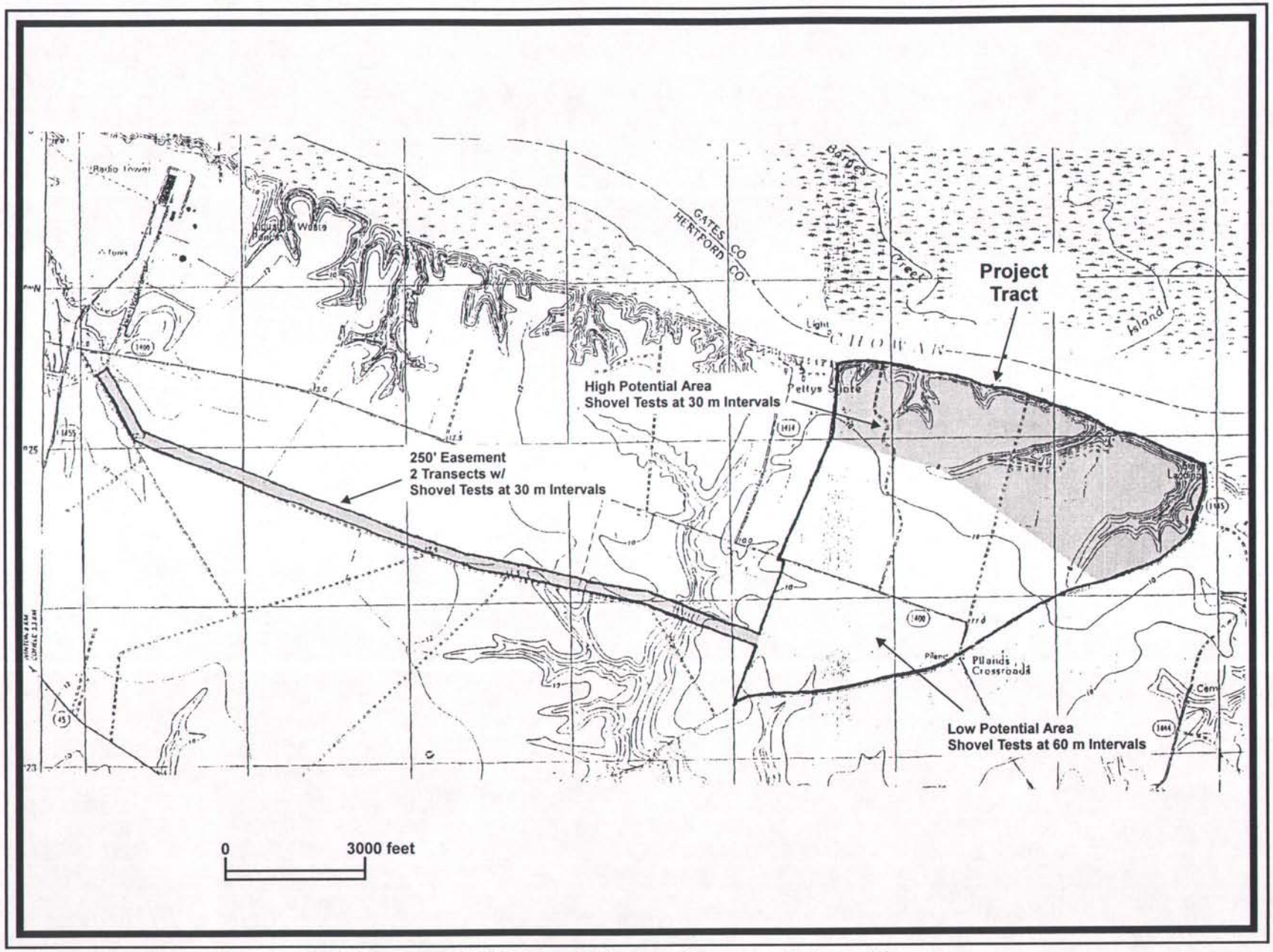

Figure 2. High and low potential areas at NUCOR Steel Company's proposed plate mill tract.

tributaries would be more likely to contain archaeological sites than areas located farther from the river. The defined distances (1,000 ft/300 m from the river and 300 ft/100 m from its tributaries)were interpreted from the locations of known sites in the Coastal Plain and following discussions with the NCOSA (Mark Mathis, personal communication August 1998).

Field investigations were initiated following the acceptance of the Scope of Work by the SHPO and NCOSA on 19 August 1998. Approximately 67 person-days were expended during the examination of the project tract. Todd McMakin served as Field Director and was present during all phases of the field investigations.

Archaeological survey of the high potential areas and the rail access corridor involved the pedestrian traverse of transects spaced at 100 ft (30 m) intervals; shovel tests were excavated at 100 ft (30 m) intervals along each transect. Figure 3 displays the areas examined at 100 ft (30 m) intervals. High potential areas represent approximately 48 percent of the project tract, including the rail access corridor. Three portions of the high potential area were not examined in this manner. These areas included the cluster of modern residences located in the northeast portion of the project tract (containing 10 acres/ 1.0 percent of the project tract), a severely disturbed area in the southeast portion of the project tract (containing 2.5 acres/ 0.25 percent of the project tract), and an agricultural field located in the east central portion of the tract (containing 3.5 acres/ 0.35 percent of the project tract- see Figure 3). The ground surface of these areas was inspected along transects spaced at 100 ft (30 m) intervals. Judgmentally placed shovel tests were excavated near the residences and in the disturbed area to ensure that these portions of the tract contained no intact soil deposits; the agricultural field was not shovel tested at the request of the landowner.

Low potential areas in the project tract were examined along transects spaced at 200 ft (60 m) intervals (see Figure 3); shovel tests were excavated at 200 ft (60 m) intervals along these transects and in any locales suspected to contain archaeological materials (e.g., small rises adjacent interior wetlands). Low potential areas represent approximately 52 percent of the project tract.

All shovel tests measured 1 by 1 ft (30 by 30 cm) and were excavated into sterile soils, approximately 1-3 ft (30-90 cm) below the ground surface. Fill from all shovel tests was screened through 0.25 inch (6.35 mm) wire mesh screen. Artifact producing locales were noted on project maps and subjected to reduced interval shovel testing. During site delineation activities, shovel tests were excavated at 50 ft (15 m) intervals to determine the site boundaries. Minimally, eight shovel tests were excavated at each locale to determine the limits of associated artifact-bearing deposits.

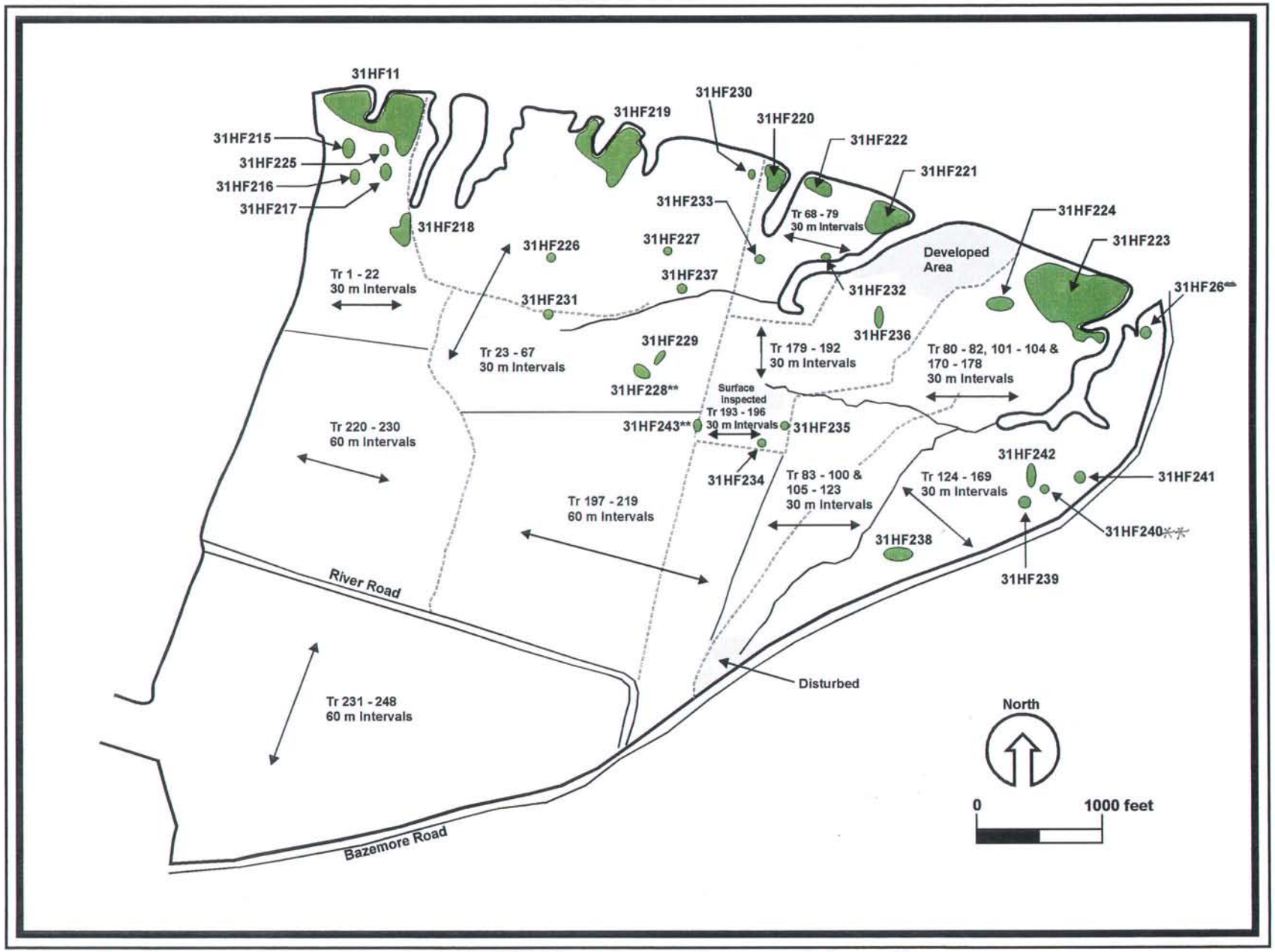

Figure 3. Transect and site locations in the NUCOR Steel Company's proposed plate mill.

Information regarding soil stratigraphy, location, and general observations was recorded in field books for each shovel test.

All artifacts were placed in resealable acid-free bags in the field and labeled with appropriate provenience information, including shovel test, transect, and temporary site number. All transects and shovel tests, as well as located sites and isolated finds were plotted on project maps. In addition, plan maps were prepared for each identified site and isolated find. These maps include the locations of all excavations, natural and cultural features, a scale, and a north arrow.

An archaeological site is defined as a locale that contains five or more artifacts, or where surface or subsurface cultural features exist. An isolated find is defined as a location producing four or fewer artifacts and no cultural features. Obviously redeposited artifacts often are identified as isolated finds, even if five or more artifacts are present.

Underwater Remote Sensing Survey. Underwater investigation of the Chowan River bank line adjacent to the project tract (see Figure 1) included magnetometer and side scan sonar surveys from a 25-ft vessel, using a Geometrics 881 cesium magnetometer and a Marine Sonics 600 kHz side scan sonar. The magnetometer was operated using MAGSEA™ data acquisition software. Magnetic data was collected and recorded at 1-second sample intervals (or approximately every seven feet/2.1 m along a track line while traveling at 4 knots) at a depth of approximately 20 ft (6 m) above the bottom surface. The marine magnetometer sensor was towed astern of the port side directly aft of the global positioning system (GPS) antenna. Lay-back of the magnetometer sensor was 50 ft (15 m) from the GPS antenna. In water depths exceeding 25 ft (7.6 m), additional weight was added to the magnetometer sensor cable to maintain a consistent sensor height above the bottom. The side scan sonar was operated on a 50-meter scale setting, recording a width of 330 ft (100 m) of bottom surface per transect. The side scan sensor was towed at a depth of approximately 5-20 ft (1.5-6 m) below the water surface, depending on water depth. The sonogram record was monitored constantly to develop the most detailed bottom image possible.

The remote sensing survey was conducted with the aid of an onboard computer navigation system, interfaced with a Differential Global Positioning System (DGPS). The DGPS consisted of a NavStar™ receiver system operating with a Coast Guard differential radio link. A GPS receiver and radio link also were located aboard the survey vessel and interfaced with a PC computer system. HYPACK™ hydrographic survey software was used to generate parallel survey lines spaced 25 ft (7.6 m) apart. It also provided and maintained constant positioning data. The side scan sonar was

utilized only on two survey lines – one approximately 50 ft (15 m) from the shoreline and one approximately 150 ft (45 m) offshore. Detailed discussion of the interpretation of data collected during the remote sensing survey is presented in Appendix A.

Wes Hall directed and was present during all phases of the underwater field investigations. Approximately three person-days were expended during the remote sensing survey.

Laboratory Methods

All recovered artifacts were transported to the Brockington and Associates, Inc., Charleston laboratory facility, where they were washed, cataloged, and analyzed. Laboratory personnel assigned distinct provenience numbers to artifacts from each supplemental shovel test and nonsystematic surface find. They separated artifacts from each provenience by class/type and assigned catalog numbers.

The basis of the prehistoric and historic artifact analyses was observable stylistic and technological attributes. Artifacts were identified by material of manufacture (e.g., ceramic, glass, metal), color, function, decoration, and method of manufacture, when possible. Temporally diagnostic artifacts were compared with published analytical sources. Sources employed for artifact identifications are presented in Table 2. Prehistoric *residual* ceramic sherds are fragments with a maximum dimension of 1.0 inch (2.5 cm) or less. Upon acceptance of the final report, field notes, photographs, maps, and artifacts will be transferred to a facility approved by the NCOSA for permanent curation.

Table 2. Sources Employed During Artifact Identification and Analysis.

Prehistoric Artifacts	Historic Artifacts
Coe 1964	Noël Hume 1970
Green 1986	South 1977
Oliver 1981	
Phelps 1983	

Assessing NRHP Eligibility

Cultural resources in the project tract were evaluated for listing on the NRHP. As per 36 CFR 60.4, there are four broad evaluative criteria for determining the significance of a particular resource and its eligibility for the NRHP. Any property (building, structure, site, object, or district) that:

A. is associated with events that have made a significant contribution to the broad pattern of history,

B. is associated with the lives of persons significant in the past,

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

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

may be eligible for the NRHP. A property may be eligible under one or more of these criteria. Criteria A, B, and C are most frequently applied to historic buildings, structures, objects, non-archaeological sites (e.g., battlefields, natural features, designed landscapes, or cemeteries), and districts. The eligibility of archaeological sites is most frequently considered with respect to Criterion D. Also, a general guide of 50 years of age is employed to define "historic" in the NRHP evaluation process. That is, all properties greater than 50 years of age may be considered. However, more recent properties may be considered if they display "exceptional" significance (Sherfy and Luce n.d.).

Following *National Register Bulletin* (NRB) 15: *How to Apply the National Register Criteria for Evaluation* (National Park Service [NPS] 1991:3), evaluation of any property requires a twofold process. First, the resource must be associated with an important historic context. If this association is demonstrated, the integrity of the resource must be evaluated to ensure that it conveys the significance of its context. The applications of both of these steps are discussed in more detail below.

Determining the association of a property with a historic context involves five steps (NPS 1991:7). First, the property must be associated with a particular facet of local, regional (state), or national history; examples relevant to this project include Late Woodland Utilization of the Chowan River Valley, Antebellum Agricultural Development in the Coastal Plain of Northeastern North Carolina, or Late Nineteenth/Early Twentieth Century Development of Towns and Communities in North Carolina. These facets will represent the context within which any particular property developed.

Secondly, one must determine the significance of the identified historical facet/context with respect to the property under evaluation. As an example, if the project tract contained no buildings that were constructed during the early nineteenth century, then the Antebellum Agricultural context noted above would not be significant for the development of the project area or any of its internal properties. Similarly, a lack of archaeological sites within the project tract would preclude the use of contexts associated with the prehistoric use of a region.

The third step is to demonstrate the ability of a particular property to illustrate the context. A property should be a component of the locales and features created or used during the historical period in question. Early nineteenth century farm houses, the ruins of African American slave settlements from 1820s, and/or field systems associated with particular Antebellum plantations in the region would illustrate various aspects of the agricultural development of Hertford County prior to the Civil War. Conversely, contemporary churches or road networks may have been used during this time period but do not reflect the agricultural practices suggested by the other kinds of properties.

The fourth step involves determining the specific association of a property with aspects of the significant historic context. *NRB 15* (NPS 1991:11-24) defines how one should consider a property under each of the four criteria of significance. Under Criterion A, a property must have existed at the time that a particular event or pattern of events occurred and activities associated with the event(s) must have occurred at the site. In addition, this association must be of a significant nature, not just a casual occurrence (NPS 1991:12). Under Criterion B, the property must be associated with historically important individuals. Again, this association must relate to the period or events that convey historical significance to the individual, not just that this person was present at this locale (NPS 1991:15-16). Under Criterion C, a property must possess physical features or traits that reflect a style, type, period, or method of construction; display high artistic value; or, represent the work of a master (an individual whose work can be distinguished from others and

possesses recognizable greatness [NPS 1991:20]). Under Criterion D, a property must possess sources of information that can address specific important research questions (NPS 1991:22). These questions must generate information that is important in reconstructing or interpreting the past (Butler 1987; Townsend et al. 1993). For archaeological sites, recoverable data must be able to address specific research questions.

After a property has been specifically associated with a significant historic context, one must determine what physical features of the property are necessary to reflect its significance. One should consider the types of properties that may be associated with the context, how these properties represent the theme, and which aspects of integrity apply to the property in question (NPS 1991:8). As in the Antebellum Agriculture example given previously, a variety of properties may reflect this context (farm houses, ruins of slave settlements, field systems, etc.). One must demonstrate how these properties reflect the context. The farm houses represent the residences of the principal landowners who were responsible for implementing the agricultural practices that drove the economy of eastern North Carolina or Hertford County during the Antebellum Period. The slave settlements housed the workers who conducted the vast majority of the daily activities necessary to plant, harvest, process, and market crops.

Once the above steps have been completed and the association with a historically significant context has been demonstrated, one must consider the aspects of integrity applicable to a property. Integrity is defined in seven aspects of a property; one or more may be applicable depending on the nature of the property under evaluation. These aspects are *location, design, setting, materials, workmanship, feeling, and association* (36 CFR 60.4; NPS 1991:44). If a property does not possess integrity with respect to these aspects, it cannot adequately reflect or represent its associated historically significant context. Therefore, it cannot be eligible for the NRHP. To be considered eligible under Criteria A and B, a property must retain its essential physical characteristics that were present during the event(s) with which it is associated. Under Criterion C, a property must retain enough of its physical characteristics to reflect the style, type, etc., or work of the artisan that it represents. Under Criterion D, a property must be able to generate data that can address specific research questions that are important in reconstructing or interpreting the past.

Chapter II. Natural and Cultural Setting

Natural Setting

A Description of the Project Tract

The site of NUCOR Steel Company's proposed plate mill is a 900± acre (364± ha) parcel located on the west bank (ascending) of the Chowan River in east central Hertford County. This parcel lies approximately 7.4 miles (11.8 km) downstream from the City of Winton. A proposed rail access corridor extends northwestward from the 900± acre (364± ha) parcel to an existing untilities easement. This corridor is approximately 14,500 ft (4,420 m) long and 250 ft (76 m) wide except near the 900± acre (364± ha) parcel where the rail corridor widens to approximately 400 ft (122 m). Docking facilities for barges to serve the proposed plate mill also are planned on the Chowan River frontage of the 900± acre (364± ha) parcel. The area within 250 ft (76 m) of the bankline of the river also is considered a portion of the project tract for the purposes of this survey (see Figure 1 and Appendix A). Thus, the terrestrial portion of the project tract contains approximately 990± acres (400± ha), with 900± acres (364 ha) in the primary parcel and 90± acres (36± ha) in the rail access corridor (see Figures 1 and 2).

The 900± acre (364± ha) parcel is bounded to the north by the Chowan River, which generally flows west to east. The parcel possesses a river frontage of approximately 7,700 ft (2,350 m). The eastern and southern boundary of this parcel are formed by Bazemore Road. The western boundary of this parcel adjoins private property and follows an unnamed tributary of the Chowan River in the northwest corner of the parcel. River Road, running parallel to the Chowan River, passes through the central portion of the 900± acre (364± ha) parcel, intersecting with Bazemore Road near the midpoint of the parcel's eastern boundary. A number of small dirt roads extend northward from River Road passing through the project tract to the Chowan River. The 900± acre (364± ha) parcel contains approximately 20 acres (8.1 ha) of wetlands, located primarily along the small unnamed tributaries of the Chowan River that flow northward across the project tract (see Figure 1). The remaining 880± acres (356± ha) of this parcel are uplands covered in planted pines with a dense understory of small hardwood or deciduous trees, or areas of planted pines that have been recently harvested. Figure 4 displays views of wooded areas in the project tract; examples of planted woodlands and reforested woodlands are shown. Small agricultural fields and residential lots also are present in the central portion of the tract between River Road and the Chowan River

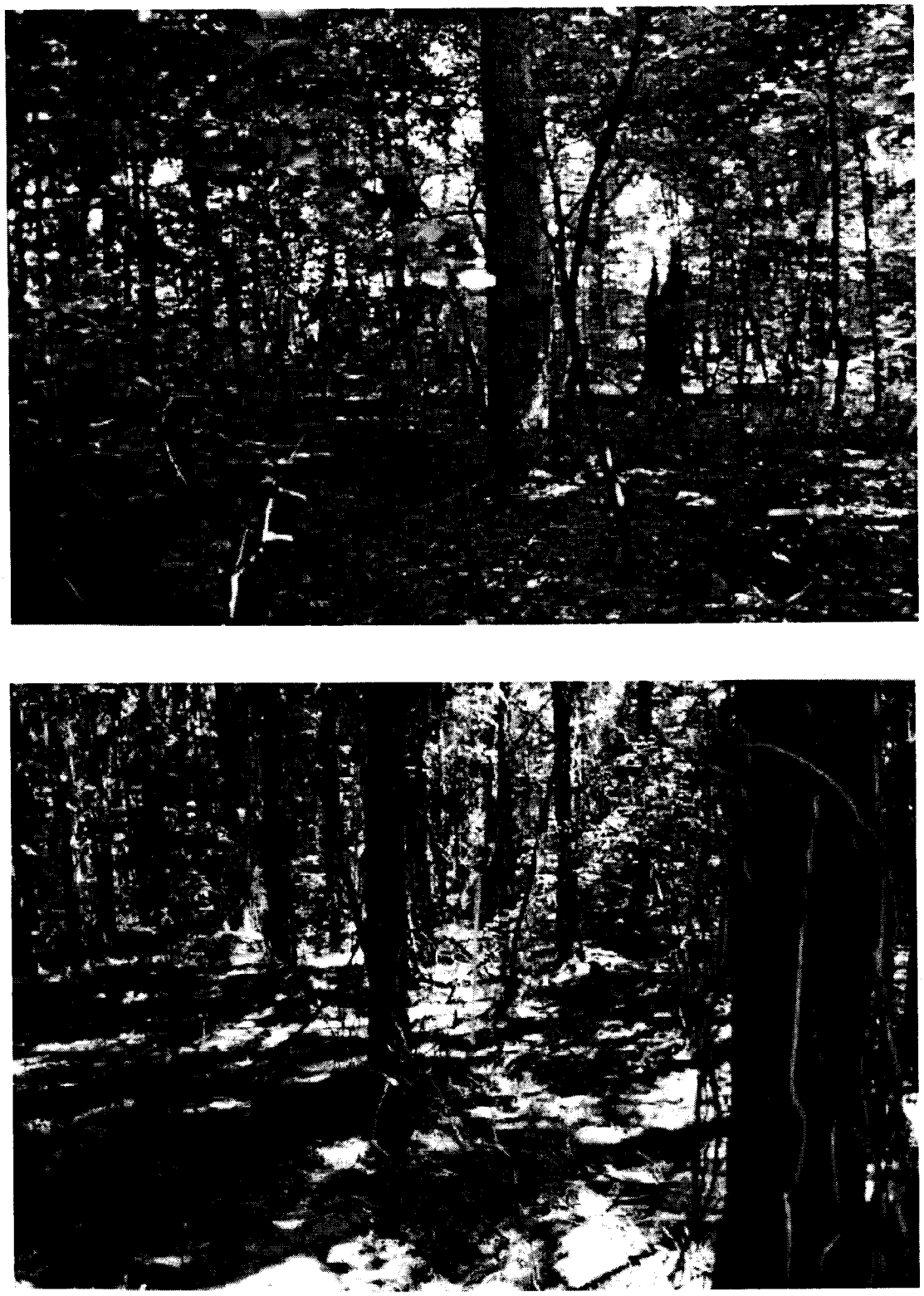

Figure 4. Views of wooded portions of the project tract. Top: mixed pines and hardwoods in reforested areas. Bottom: planted pines.

(see Figure 3). The agricultural fields were fallow or planted in soybeans at the time of this survey. The residential lots were surrounded by grassed yards.

The 900± acre (364± ha) parcel generally lies 30-35 ft (9-11 m) above the Chowan River. Near the project tract, the river lies immediately adjacent to its west bank with little or no flood plain between the river bank and the toe of the bluff. The opposite bank of the river possesses an extensive swamp, covered in bottomland hardwood forest. Topography in the 900± acre (364± ha) parcel generally is flat except along the unnamed tributaries of the Chowan River. As these drainages near the river, they have cut gullies or draws through the bluff resulting in dramatic changes in elevations from the flat uplands to the bottoms of the drainages. Soils in the 900± acre (364± ha) parcel include Craven fine sandy loams, Leaf loam, and Lenoir loam on the flatter uplands; Craven fine sandy loams and Winton soils on the slopes leading into the drainages; and Dorovan soils along the bottoms of the largest drainages (Kirby 1984: Plate 8). The Craven soils occur most frequently in the northeastern portion of the project tract. The western and southern portions of the tract contain primarily Leaf loam with small pockets of Lenoir loam along the bluff of the Chowan River. The Winton soils occur in small narrow pockets on the bluff as well. The majority of these soils possess drainage characteristics that require some modification for optimal agricultural use.

The rail access corridor extends westward from the southwest corner of the 900± acre (364± ha) parcel. For the most part, the corridor follows a dirt road that parallels River Road approximately 2000 ft (600 m) to the south. The corridor passes through lands very similar to those present in the 900± acre (364± ha) parcel. Near this parcel, it crosses the headwaters of tributaries of Wiccacon Creek and then it crosses relatively flat interior uplands. Craven fine sandy loams, Lenoir loam, and Winton soils are present where the corridor intersects the drainages; Leaf loam covers the flat areas farther west (Kirby 1984:Plate 8). Most of the lands crossed by the rail corridor are covered in planted pines or recently harvested areas.

Most of the timberlands in the project tract and the surrounding portions of Hertford County have been subjected to intensive silviculture practices. These practices usually are employed in the Atlantic Coastal Plain to enhance timber production by reducing soil moisture content in areas that receive planted pines. Foresters routinely employ these practices throughout their lands in North Carolina, South Carolina, and Georgia; a portion of the project tract is owned by Union Camp Corporation. Silviculture practices include clear cutting timber stands using large skidders and trucks to collect and remove the timber, raking the clear cut areas with large tined "rakes" pulled behind large tractors to remove stumps and debris left from harvesting, and preparing the clear cut

areas for replanting with 32 inch (80 cm) disks pulled behind large tractors. Debris raked from the harvested areas may be pushed into large piles or wind rows by bulldozers; sometimes this debris is burned. The raked and disked areas then are plowed to create long narrow beds separated by deep furrows that will receive pine seedlings. Most seedlings are planted by large rubber tired machines. They then receive pesticides from large tired tractors or aerial sprays until they are 1-2 years old (Steve Brown, Union Camp forester, personal communication 1993). These procedures can be repeated every 11-15 years depending on the rate of growth of the pine species under cultivation (Garrett Albert, Branigar Organization/Union Camp land manager, personal communication October 1998).

Soil horizons may be affected 1-3 ft (0.3-0.9 m) below the ground surface by these silvicultural practices. For the most part, these are the same soil horizons that contain most archaeological materials in the Coastal Plain of North Carolina. The potential for these silvicultural practices to disrupt intact archaeological deposits and to fragment and displace artifacts is very high. As will be described in Chapter III, the small size of artifacts recovered from the project tract and the highly turbated soils encountered throughout the project tract attest to the effects of these practices.

Regional Setting

The project tract is located in east central Hertford County. Hertford County contains portions of the two physiographic regions of the Coastal Plain, the Tidewater and the Inner Coastal Plain. The eastern portions of the county along the Chowan River, including the project tract, lie in the Tidewater region; the portions of the county away from the Chowan River lie on the Inner Coastal Plain (Stuckey 1965).

The Coastal Plain of North Carolina is a region of level uplands separated by numerous rivers that flow into the sounds of North Carolina's northern and central coast. The Coastal Plain consists of marine sediments derived from ancient oceans that once covered this portion of North America. The Coastal Plain possesses a series of terraces that represent former shorelines of Quaternary seas. The Tidewater region of the Coastal Plain lies on the Pamlico Terrace, a remnant of late Pleistocene shorelines. The Talbot Terrace, containing the project tract and most of Hertford County, lies inland from the Pamlico Terrace, separated from the younger Pamlico deposits by the Suffolk Scarp. This

scarp appears to contain deposits dating from the Sangamon Interglacial and effectively separates the Tidewater region from the Inner Coastal Plain (Stuckey 1965).

Topography in the region is relatively flat although elevations generally are higher in the western portion of the county. Numerous creeks and swamps dissect the relatively flat plain of the region. All of these drainages flow into the Chowan River, either directly or by way of its major tributaries, the Meherrin and Wiccacon Rivers (Kirby 1984:1). Soils in the region vary from well drained sandy soils to heavy loams or mucks along the major drainages; most of the county, including the project tract, is covered by very poorly drained to moderately well drained soils of the Craven-Leaf-Caroline or Leaf- Lenoir-Craven associations (Kirby 1984). Better drained soils occur in large pockets in the eastern end and the northwestern corner of the county. A number of researchers in the Coastal Plain (e.g., Green 1986; Phelps 1983) have suggested an association between these better drained soils and Native American communities that may have depended on agriculture for a major portion of their subsistence.

The majority of Hertford County (53 percent in the early 1980s) is covered in forested lands; about half of these forests are dominated by pines. Many of the pines have been planted for commercial timber production. Pines, particularly loblolly, grow well on the better drained soils of the county. However, pines can be grown on almost any soils if the appropriate bedding and furrowing practices (see above) are implemented (Kirby 1984:33-34). Approximately 25 percent of the county lies in croplands and pasture. Peanuts, corn, soybeans, and tobacco are the principal crops (Kirby 1984:29).

Hertford County experiences hot humid summers and moderately cold winters. Summer temperatures average 77° F; winter temperatures average 42° F. Average annual precipitation is 45 inches (1.14 m), and is evenly distributed throughout the year. Severe winter storms are extremely rare; tropical storms and hurricanes pass over Hertford County every few years (Kirby 1984:2). One such storm passed through Hertford County during the field phase of this project.

The current climate and setting of the region likely have been in place for well over 5,000 years. Pollen data from the Coastal Plain of North Carolina indicate that the region was covered in a boreal pine-spruce forest 10,000+ years before present (BP). At this same time, sea level was significantly lower than today, on the order of 200-300 ft (60-90 m). Much of the world's water was locked in the vast glaciers that covered most of the land masses of the Northern Hemisphere at that time. As these glaciers receded, sea level rose and climate gradually changed. Between 8,000 and

10,000 years BP, the boreal forests were replaced by white pine-hemlock-northern hardwood forests. By about 8,000 years BP, forests similar to those in the region today became established (Whitehead 1972, 1973). By about 4,000 years BP, sea level had risen to within 10 ft (3.0 m) of its present stand (Bellis et al. 1975). Most of the estuaries and islands of the present coast were in place by this time although fluctuations in sea level continued to affect local conditions and settings throughout the region (cf. Brooks et al. 1989).

Cultural Setting

Prehistoric Overview

The prehistoric cultural sequence of coastal North Carolina has never been covered in a comprehensive fashion. Until the early 1980s, this region had received the least attention of any in North Carolina. Phelps (1983) summarized the current understanding of the prehistoric past of the Coastal Plain; the following overview follows closely on this outline.

Paleoindian Period (12000-8000 BC). The Paleoindian period generally is considered a time when small, highly mobile groups moved throughout the Southeast in search of large game. The period is distinguished by well made fluted or semi-fluted projectile points and formalized end and side scrapers. On the Coastal Plain, this period is generally represented by isolated occurrences of diagnostic lithic tools, such as the two fluted points recovered from White Oak River (Perkinson 1971). Phelps (1983:21) reports that "with so few recorded sites, it is impossible to discuss settlement patterns in a meaningful way; the most that can be said at the moment is that fluted points typical of the early Paleoindian period occur at widely scattered locations in the Coastal Plain." Sea level during this period was so much lower than today that most of the present coastal strand was more similar to the modern Inner Coastal Plain.

Early Archaic Period (8000-6000 BC). The Early Archaic period was a time of adaptation to a warming, moistening, post-glacial climate, and witnessed the climax of the oak-hickory forest. In North Carolina, Early Archaic occupations are recognized by corner-notched or side notched projectile point types first defined by Coe (1964). There is a marked increase in the number of Early Archaic sites in the Coastal Plain relative to the preceding period. Unfortunately, few stratified sites associated with this period have been investigated to date (Phelps 1983:24). The distribution of sites in this period suggests that Early Archaic occupants of the Coastal Plain were taking advantage of the many natural resources that were appearing on the Coastal Plain during this period. Some

interpretations of Early Archaic site distributions on the Coastal Plain and adjacent regions suggest that loosely defined band territories may have evolved by this time (Anderson and Hanson 1988).

Middle Archaic Period (6000-4000 BC). Populations of the Early Archaic seemingly had adjusted to the oak-hickory forest when another environmental shift occurred. The Middle Archaic period saw the cultural response to a peak in dryness and warmth, and to a sea level which was approaching modern levels. The period is recognized by Stanly, Morrow Mountain, and Guilford projectile points (Coe 1964). Sites of this period in the Coastal Plain generally are small.

Late Archaic Period (4000-1000 BC). It appears that the Late Archaic was a time when adaptation and settlement became more focused, and primary forest efficiency had developed (Caldwell 1958). Primary forest efficiency entailed the intense use of woodland environments by semi-sedentary, locally adapted cultures. Environmentally, the mixed hardwood and pine communities similar to modern forests became established on the Coastal Plain during this period. Sites of this period, recognized by large stemmed projectile points (e.g., Savannah River [Coe 1964]), groundstone axes, and steatite bowls, are larger than their predecessors, and suggest increased sedentism and larger social units. Interregional trade also increased during this period, and it is thought that the Late Archaic period witnessed increased localization and complexity of populations. Late in the period, fiber tempered ceramics first appeared in the material culture of the occupants of the Coastal Plain. Although more common in sites south of the Neuse River, several examples of Stallings Plain ceramics have been reported from the estuary and tributaries of the Chowan River (Phelps 1983:26-27).

Early Woodland Period (1000-300 BC). The Early Woodland period in the region is marked by the presence of sand tempered Deep Creek ceramics. Cord marking is the prevalent surface decoration during this period, although net impressed, fabric impressed, and plain wares also are common. Examples of Marcey Creek steatite tempered wares, common on the Middle Atlantic Coastal Plain to the north, also have been found in early Deep Creek ceramic assemblages in the northern portion of the Coastal Plain (Phelps 1983:29). Sites of this period appear to represent a continuation of the Late Archaic settlement patterns described above.

Middle Woodland Period (300 BC to AD 800). The Middle Woodland is characterized by sand and/or grit tempered Mount Pleasant ceramics. Fabric impressing, net impressing, cord marking, smoothing, and incising represent the principle decorative types. Clay tempered Hanover Cord Marked and Fabric Impressed wares (from the southern Tidewater) and shell tempered

Mockley Net Impressed and Cord Marked (from the Virginia Coastal Plain to the north) also have been recovered in small quantities with Mount Pleasant types (Phelps 1983:32-33). Numerous burials associated with this period reflect both primary inhumation and cremation; both types of burials may be associated with low sand mounds.

Mount Pleasant phase sites display a markedly different pattern of distribution than evidenced in earlier periods. Sites tend to occur more frequently on the larger drainages, along the estuaries, and on the coastal strand. The presence of dense deposits of shellfish remains suggest that this resource had become a primary component of the Middle Woodland subsistence strategy. Seasonal occupation of these sites, with other locales being visited during a yearly cycle to collect a different suite of resources appears to represent the subsistence pattern during the Middle Woodland. An increased dependence on domesticated plants also may be indicated by the presence of maize pollen in cores from the Great Dismal Swamp region dating from approximately 2000 years ago (Whitehead 1972:311).

Late Woodland Period (AD 800 to 1750). Late Woodland archaeological sites in the northern Coastal Plain of North Carolina are identified by the presence of Colington phase shell tempered fabric impressed, simple stamped, and incised wares. Examples of the pebble tempered Cashie wares from the interior Coastal Plain also occur with some frequency in the Tidewater portion of the northern coast. Shell tempered wares are associated with Algonkian speaking groups throughout the Middle Atlantic region during the Late Woodland period (e.g., the Chowanoac who inhabited in the project area during the 1500-1700s- Swanton 1952:77-78). A similar association is indicated for the northern Coastal Plain of North Carolina. The interior Cashie wares appear to be associated with the Iroquoian speaking Tuscarora, Meherrin, and Nottoway groups who occupied the Inner Coastal Plain of North Carolina and Virginia until the early eighteenth century (Swanton 1952:82, 85-88).

The Late Woodland occupants of the northern Tidewater were focusing on horticulture with estuarine and sound resources contributing greatly to their subsistence. This focus apparently allowed the establishment of year-round settlements. Their temperate zone horticulture produced primarily exotic varieties of plants and quickly exhausted the soil, requiring movement of villages every five to twenty years. The relatively rich estuarine and sound zones provided both year-round sustaining and "starving time" emergency foods. The latter stems from the variety, stability, and reliability of resources which could be exploited by virtually all members of a group, whatever their age or skill. The ability to reassign members of the group to the acquisition of these resources led

to increased dependence on the coastal zone in the Late Woodland, and a possible reduced emphasis on high-risk low-return pursuits such as hunting. The presence of palisaded villages and multiple interment ossuaries argues that prehistoric social complexity peaked in the Late Woodland period.

Historic Overview

In 1578, Queen Elizabeth I granted a large segment of the New World to Sir Humphrey Gilbert. This grant included all of what is now North Carolina. Gilbert, who intended to make Elizabeth the "monarch of the seas," was defeated by the Spanish in the New World and returned to England. His grant was renewed in 1584 in the name of his half-brother, Sir Walter Raleigh. Raleigh was the first person to attempt to colonize the grant. Raleigh's colonizing attempt failed, and in 1606, the Virginia Company of London received a charter permitting settlement along the east coast of North America. A permanent settlement at Jamestown, Virginia was established the following year. The company's charter included North Carolina, but no attempt was made to place a settlement there. The Virginia Company's charter was revoked in 1624, and in 1629, King Charles I conveyed the region south of Virginia to Sir Robert Heath, his attorney general. Heath assigned the charter to Henry Lord Maltravers, who made only one effort to colonize the grant. That effort was unsuccessful (Powell 1968).

During the 1650s, settlers from Virginia began to move into Carolina. These settlers purchased land from the Native Americans, and initially settled along the Chowan River. In 1663, after the restoration of Charles II to the throne of England, Heath's charter was revoked, and Carolina was granted to a group of the King's faithful friends, collectively called the Lords Proprietors (Powell 1968). A settlement was established at the mouth of the Cape Fear River at this time by Anglicans from the West Indies and Puritans from New England; this settlement later collapsed (McLeod n.d.).

Under the Lords Proprietors, settlement in Carolina began in earnest. However, initial settlement focused on what would become South Carolina rather than North Carolina, due primarily to the more accessible harbors and estuaries along the coast of what would become South Carolina. Charles Towne (Charleston) was established in 1670, and settlement rapidly spread inland along the coastal rivers. A sense of the colony of North Carolina as distinct from South Carolina emerged after 1689, when the Lords Proprietors appointed Philip Ludwell as the colony's first governor (Butler and Watson 1984:80). Settlement in North Carolina spread up the Cape Fear River, the only accessible estuary of size, after 1720. Brunswick was established on the south bank of the river, near

its mouth, in the 1720s; in the next decade, Wilmington was established on the opposite bank approximately 16 miles (26 km) above Brunswick (Meyer 1963:24).

Despite a brief period of political stability near the turn of the eighteenth century under Governor Ludwell, the early decades of the century were characterized by continued instability. The European wars were disrupting the shipping that the coastal North Carolinians depended upon, there were great political divisions within the colony, a border dispute made relations with Virginia difficult, and the western territories were being populated rapidly and unevenly. Apparently the Lords Proprietors did not have a good understanding of the problems inherent in administering a colony. By the 1720s, the currency was almost worthless, piracy and smuggling flourished, English laws were not always enforced, and the colonists had been allowed to pass laws which were not in the interest of England. In 1729, all but one of the Proprietors sold out to the Crown and Carolina became a royal colony; it was divided into two separate colonies, North and South Carolina (Powell 1968). The single proprietor who refused to sell was Lord Carteret, who controlled the northern region of North Carolina; later known as the Granville District. By 1730, this district was the only portion of North Carolina not under the direct authority of the King (Powell 1989:86).

In the 1730s and 1740s, settlers began to move into the interior of the state. The British government encouraged settlement of the back country by making large grants to wealthy men who were expected to recruit settlers and assist them in getting started. Another impetus to settlement was that the lands along the coast had already been taken up; some acreage already had become unproductive from years of intensive farming. New settlers coming south from Virginia, and west from eastern North Carolina, were looking for new fertile land. These people spread into the interior along the major river valleys.

This rapid settlement of the western areas of the colony generated tensions which came to a head in the 1760s and early 1770s. Speculation and extortion made settling the western territories expensive; these, combined with only occasional support from the colonial government generated anger and unrest among the settlers. The Enfield Riot of 1759 was an opening salvo, and discontent spread even further west in the 1760s. The War of Sugar Creek erupted in Mecklenburg County in 1765, and the Regulator movement emerged within two years. The Regulators fought against official corruption, an inequitable tax system, and currency constriction. The movement came to a head in 1771 with the Battle of Alamance, in which colonial troops defeated the Regulators (Butler and Watson 1984:103-109).

By this time, however, relations with Great Britain were beginning to signal an impending break with the mother country. While the Regulator movement was not a proto-Revolutionary War movement in terms of promoting republican government as some earlier historians were wont to claim, it did reinforce "a pattern of antiauthoritarian behavior that helped prepare many for the ultimate break with Great Britain" (Butler and Watson 1984:109). Consolidating support for the patriot cause was difficult in North Carolina given the variety of white settlers and immigrant groups; constituencies as different as the Scots Irish, Moravians, Quakers, and Highland Scots were bound to react very differently to a proposal to break with Britain. In the face of this situation, political leaders in the colony created an elaborate provisional government in the early and mid 1770s; as one historian (Butler and Watson 1984:131) has noted, "the new structure built upon and formalized the extralegal activities of local and district committees and provincial congress." Finally, "they had attempted to bring together by cooperation and conciliation all the diverse elements that made up the white population of North Carolina in 1775" (Butler and Watson 1984:131).

During the American Revolution, the region was a center of both Whig and Tory activities. Patriot General Francis Marion had his headquarters for the Marion Brigade in the area. In 1781, after the Battle of Guilford Courthouse, British General Cornwallis retreated through eastern North Carolina on his way to Yorktown (US Army Chief of Staff G-3 n.d.; Parker 1990). North Carolina's Irregulars, the militias and volunteer troops throughout the area, kept control of the small outbursts of Loyalism. The signal event in this regard was the Battle at Moore's Creek Bridge in 1776, when Loyalist forces were defeated by North Carolina irregulars (Butler and Watson 1984:133)

During the late eighteenth and early nineteenth centuries, agricultural production and trade remained the principal focus of the local economy in the eastern part of the state. While some larger landholdings developed into plantations, many small independent farms also continued to flourish. This economic development generally continued until the middle of the nineteenth century, when the Civil War disrupted all activities within the Southern states. Prior to the outbreak of the Civil War, plank roads were constructed in the region in an attempt to improve the transportation of goods to market. These roads required a lot of maintenance which could not be done during the Civil War. They were abandoned about the time the war ended (Robinson 1986:32).

North Carolina's antebellum experience differed from that of many of its neighbors. Given geographic, political, and cultural situations, extensive plantations never developed the dominance that they did in other southern states. Slavery was a different experience also, as individual

slaveholdings were smaller than in other southern states. This, combined with the fact that North Carolina was settled in part by groups who were either inimical to slavery or were unconvinced of its necessity, such as Quakers, Moravians, and Scots Irish, made North Carolina the most ambivalent state with regard to slavery. North Carolinians were never politically unified in regard to slavery, and abolitionist and manumission societies survived with much greater frequency than in other southern states (Butler and Watson 1984:194-195). Despite regular state support for banking, and for railroad construction and other internal improvements, the state remained a predominantly agricultural state through the onset of the Civil War (Butler and Watson 1984:220).

Despite its ambivalence on slavery and secession, North Carolina joined the Confederacy, and was the scene of several battles in the Civil War, both large and small. During and after the War, North Carolinians suffered as did southerners in other states: the loss of life and capital, the ending of slavery, and the destruction of land and buildings was devastating. While North Carolina witnessed some industrial growth during the Reconstruction years of the late 1860s and early 1870s, the state remained much like the other southern states, a poor, primarily agricultural and rural state turning heavily toward sharecropping and tenancy in farming. Conservative Democrats lost power only temporarily, during the federally-enforced Reconstruction. In the late nineteenth century conservatives regained their power in the state government and instituted fiscal retrenchment by limiting allocations for infrastructural development and public schooling.

Following the Civil War, many of the large farms and plantations were broken up into smaller parcels. This resulted both from attempts by the federal government to provide the recently freed slaves with land, but also from the dire economic straits of the former large landholders. In either event, the general size of farms decreased while the number of farms increased. Wage labor, share cropping, and tenant farming soon replaced the former slave labor system of the antebellum South. Interestingly, agricultural production actually returned to pre-War levels, and in many instances, surpassed production levels of the first half of the nineteenth century (Powell 1989:416). Eventually, poor management of the farm lands resulted in an overall decline in production, and by the early twentieth century, farming throughout North Carolina was characterized by extremely poor tenants struggling to produce meager amounts of one or two cash crops, with little or no success. Many fields were no longer cultivated (Powell 1989:418).

At the same time, however, private entrepreneurs began to take hold, and local political and economic leaders became enthusiastic converts to industrialization beginning in the late 1870s. During the 1880s and 1890s, and through to the early twentieth century, North Carolina's

manufacturing grew more quickly than in most southern states. While focused on the Piedmont, this development affected the entire state to some degree. Tobacco was the first key industry, as new towns such as Winston and Durham came to life around tobacco processing plants. Cotton and textile mills were the other key industry in the state, and by 1900 North Carolina had nearly 200 mills, employing over 30,000 workers (Butler and Watson 1984:313).

A mix of small farming and increasing industrialization, with the emergence of new towns and cities around mills and processing centers, characterized North Carolina in the early twentieth century. The state government came into the hands of reformers during the Great Depression of the 1930s, and became increasingly powerful by taking over duties for public functions once handled by the counties. This affected such areas as roads, schools, and county and municipal finances, and helped to set a modern course for the state.

Hertford County and the Project Tract

English explorers began investigating the Chowan River and its surrounding territory in the late sixteenth century. Before Sir Walter Raleigh's "Lost Colony" was lost in 1584, Arthur Barlow and Ralph Lane led expeditions into what is now Hertford County. These early explorations, however, did not result in European settlements. This type of remote exploration continued in the early seventeenth century, after the settling of the Virginia colony. Virginia explorers searched the surrounding area in the mid-seventeenth century. These earliest explorers first recognized the transportation potential of the region, as the Chowan River provided access from the Virginia colony to the settlements on the Albemarle Sound.

The first royal grant in the area was given to Thomas Woodward, Sr., a settler in the Virginia colony. He received land on the western side of the Chowan River in 1663, apparently in what is now Hertford County; it is unclear, however, if he ever lived there (Minton 1976:3). More permanent settlements in the area did not begin until the late seventeenth and early eighteenth centuries. By the early eighteenth century settlers in the area primarily were from Virginia. These settlers found land along the Chowan and Meherrin Rivers and Wiccacon Creek. They drew the resources they needed to keep going from the forest. Naval stores were an important early product in the area, and settlers produced tar, pitch, turpentine, and rosin from the local forests. In addition, early settlers near the Chowan River produced hides, flax seed, beeswax, and tobacco for export.

Much of the early trade was with Virginians, moving goods both overland and by water to Norfolk (Belnay 1976:14-15, 21).

Political divisions came with the increased settlement. The area surrounding the project tract, like most lands in the coastal areas of the Carolinas, was a part of several different political jurisdictions. Perhaps the most important came in 1697, when the Carolina colony was divided into North and South Carolina. The area around the project tract was a matter of dispute between North Carolina and Virginia until 1728, when a survey team fixed the boundary line between the two states from the coast to the mountains. In 1711 the North Carolina colony was divided into three counties: Albemarle, Bath, and Clarendon. Bertie Precinct was a subdivision of Albemarle County, created in 1722, that included the project tract. As defined after a slight change in 1729, Bertie Precinct was bounded by the Roanoke River to the south and west, the Virginia/North Carolina line to the north, and the Chowan River and the Albemarle Sound to east. Northampton County was created in 1741 to include a part of what is now Hertford County. Finally, Hertford County itself was created in 1759 to include lands from Chowan, Bertie, and Northampton Counties (Winborne 1906:12-20).

By the time that Hertford County was created, the area already had a series of public landings along the several rivers and creeks, and a network of roads that connected them. These landings, which served as market and export centers, testified to the increasing commercial and social activity of the area. In addition to Virginians, New England traders plied the waters of Hertford County. These traders could take away with them such diverse goods as livestock, naval stores, skins and hides, beeswax, feathers, butter and cheese, flax seed, and indigo (Belnay 1976:21; Winborne 1906:33). By the middle of the eighteenth century, Hertford County also was producing sailing ships, particularly along the Chowan and Meherrin Rivers, while a postal route passed through the County by 1767 (Belnay 1976:23-24).

By the time of the Revolutionary War, in the early and mid 1770s, Hertford County was filled with farmers who relied on trade with merchants along the coast. The County's yeomen were ambivalent about the intended break from Great Britain; according to one historian (Parramore 1976:89), probably a majority of Hertford County's residents were Loyalists. However, many of the merchants along the coast were Patriots, and sought a break with the Crown. Hertford County's residents, who took part in the various provincial congresses and committees of safety, according to Parramore (1976:89), "were chiefly farmers who could be relied upon to follow the lead of the coastal business magnates."

Hertford County felt few impacts of the Revolutionary War in its early years. Trade actually picked up, as the Chowan and Meherrin Rivers provided safe havens for coastwise shipping traffic, and the landings in the County gained new warehouses. The ship yard at Barfield, moreover, up-river from the project area, produced an ocean-going vessel in 1780, the *Fair American.* While Hertford County sent soldiers and officers who distinguished themselves at battles as far apart as Stony Point in New York and Guilford Courthouse in North Carolina, the War did not come to Hertford County soil until the very end. During his move to Virginia in the spring and summer of 1781, the British General Cornwallis led his troops through the County's northeastern corner, destroying Wyanoke Ferry and Maney's Landing. Before they could venture further into the County, however, local troops under the command of Major Hardee Murfree turned back the Redcoats at Skinner's Bridge on the Meherrin River (Parramore 1976:94-95).

The county had only one town before the Revolutionary War, Winton, which was established along the Chowan River in 1766. After the War, however, Winton was quickly overshadowed by the new town of Murfreesboro, which was established in1787 at Murfree's Landing on the Meherrin River. It drew its population from elsewhere in the County, Virginia, and the northern states. An early historian (Winborne 1906:66) claimed of Murfreesboro that "from its infancy to the present time it has been noted for its schools and refined and intelligent citizenship." The County's first incorporated school, Hertford Academy, was created there in 1794. During the early and mid-nineteenth century two other schools were established in the town, the Chowan Baptist Female Institute and the Wesleyan Female College. In 1790, according to the first federal census, the majority of the County's landowners owned slaves. Few of these slaveowners, however, owned more than a few slaves. Of the 562 heads of families recorded in the 1790 census, 325 owned slaves; of this latter number, only 19 owned 20 or more slaves.

During the antebellum era Hertford County moved into the pattern of small farms interspersed among larger plantations that typified the Carolina Tidewater. The County's economy continued to focus on agriculture, including cotton, corn, and tobacco, with the numerous rivers and creeks housing landings which gave access to markets. In 1863, the project area was framed by two landings, the "Petty Shore" landing to the west and Yore's landing to the east (Figure 5). The project area contained one settlement in 1863, belonging to J.O. Askews; in addition, there was an "Askew's Fish'y" on the shore of the Chowan River. The Askews were a prominent family in Hertford and Bertie Counties in the nineteenth century; Winborne (1906:134) claimed that they were "people of wealth and prominence in the eastern part of the State." David Askew served as a state senator from Hertford County in the 1820s before emigrating to Mississippi late in the 1820s, while his brother,

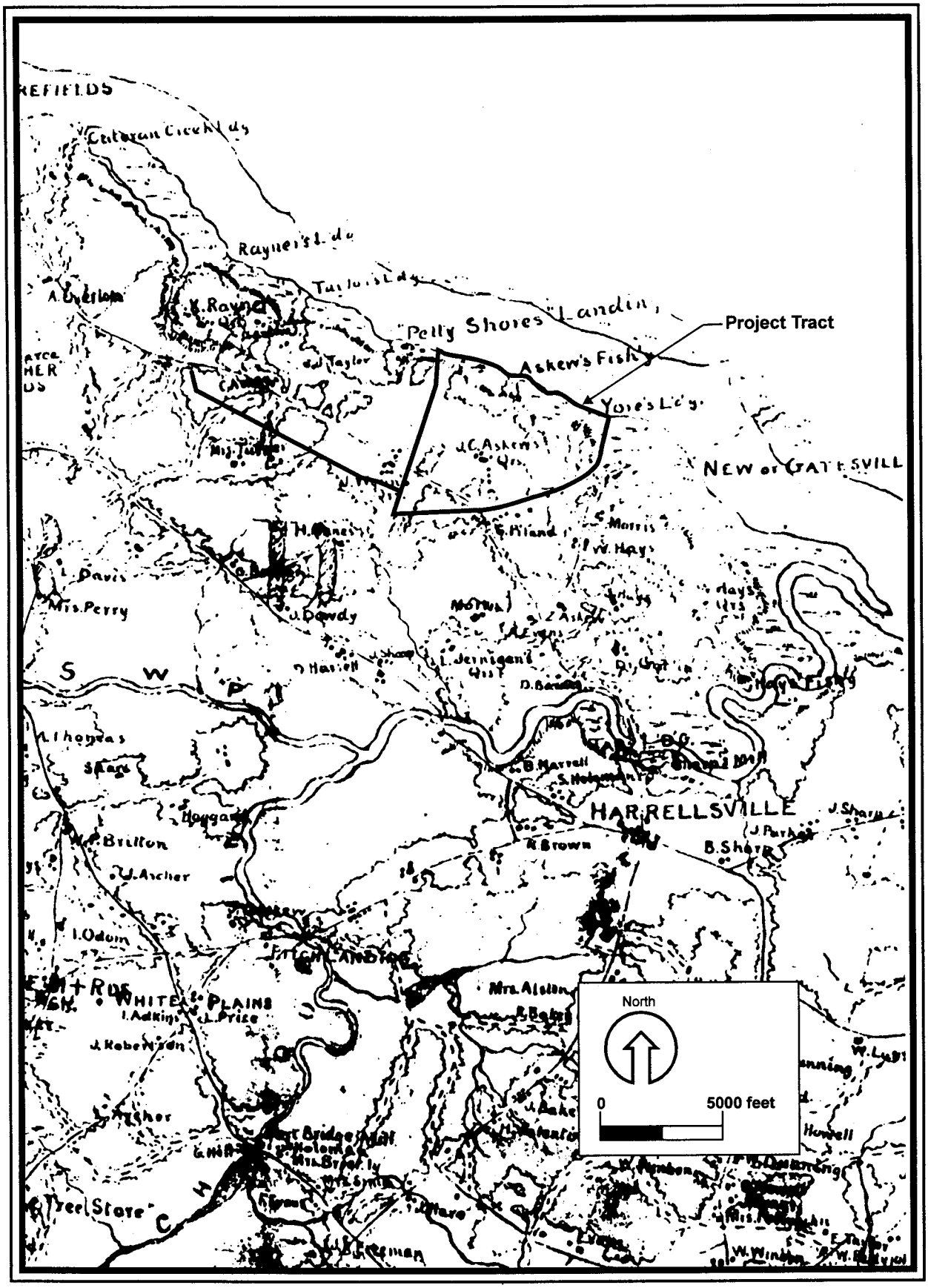

Figure 5. Map of Hertford and part of Northampton and Bertie Counties, North Carolina (1863) showing the project tract.

Dr. George Askew, served as a state senator from Bertie County at the same time. John O. Askew, who owned the project tract in the 1860s, was a cousin of these two men.

The Civil War had a great impact on Hertford County. Winton was the County's first town and the County seat. Under Brigadier General Ambrose Burnside, commander of the Department of North Carolina, Federal troops sailed out of Fort Monroe in January 1862 and arrived at Hatteras Inlet two days later. The Federals first took Roanoke Island on 8 February, then took Elizabeth City on 10 February. Elizabeth City was only lightly defended, and fell quickly. Under direction of the civic officials, Confederate troops tried to burn the town before the Federal troops could get there; they were nearly successful, burning all except two blocks (*Official Records* [*OR*] Series 1, volume 9:191). Confederate leaders then sought to call out the militias further inland, in Edenton and Hertford Counties, which had not yet been called. According to Colonel C.F. Henningsen, CSA, there were problems in getting the local militias organized: "In this region the militia will not assemble until the enemy is dangerously near. Then it becomes impossible to assemble them until they have attended to the moving of family and property. After that the [*sic*] they show a disposition to come out if there is any force to support them" (*OR* Series 1, volume 9:192).

The Confederate troops arrived near Winton from Elizabeth City by way of "the Desert Road." There an ambush was planned for the approaching Union steamers. According to Union reports:

> On the approach of the gunboat Delaware to the town a negro [*sic*] woman was discovered on the shore motioning the boat to approach. On arriving within 300 yards of the landing a large ambush of from 600 to 1,000 men was discovered, and before the boat could be stopped she was within easy musket range of the men, when they poured a volley into her, literally riddling the wheel-house and the upper joiner work, but fortunately no one was killed; nearly all the men were below (*OR* Series I, vol. 9:194).

Despite the successful ambush, the Federal troops captured Winton. According to the Federal report:

> It was determine [*sic*] by Captain Rowan and Colonel Hawkins to burn all military stores that could not be removed, with the store-houses and the quarters occupied by the troops, which constituted almost the entire town, there not being over twenty houses in the place. In one of the store-houses there was large quantity of bacon, that could not be taken away by our people and it was also burned, together with all the heavy camp equipage, and, in fact, everything that could not be transported by our gunboats. The winds shifting after the fire was started caused the destruction of

> some few houses not occupied by the soldiers. It was ascertained during the stay at Winton that the Blackwater, the river up which the expedition was destined for the purpose of destroying the railroad bridge, had been effectually blockaded by the falling of trees across it at its narrowest parts, thus rendering it almost impassable. The expedition, therefore, returned, leaving some gunboats at Elizabeth City and the mouth of the Chowan (*OR* Series I, Vol. 9:194).

There is no evidence, however, that there were any direct impacts of the war on the project tract.

The decades after the Civil War brought vast changes to Hertford County as they did throughout Coastal North Carolina and the South. As agriculture became more decentralized through the rise of tenant and sharecropping arrangements, small communities arose throughout the rural regions. Generally, a store and a mill were the heart of these hamlets, providing basic services and goods to the surrounding region; in other cases, the towns were products of the new railroads which entered the South's rural areas. At least four towns in Hertford County were incorporated in the late nineteenth and twentieth centuries: Harrellsville in 1883, Union in 1889, Ahoskie in 1893, and Mapleton in 1901 (Winborne 1906:335). In many cases the new railroads which connected the South's rural areas to regional and national markets created new towns to serve as depots; this was the case with the town of Ahoskie (Winborne 1906:300).

A 1916 Soil Survey map of Hertford County shows the project tract between Eure Landing and Petty Shore Landing (Figure 6). A new community had emerged on the southeastern border of the tract, identified as Pilands Crossroads. An unimproved road extends north from Pilands Crossroads into the project tract toward the Chowan River; two buildings are shown along this road. These buildings appear to be the ones indicated on the 1863 map of Hertford County, belonging to J. O. Askew; none of these buildings exist today. John and Mary Askew held onto the tract called Petty Shores Acres until 1918 when they sold it to the Foreman Blades Lumber Company of Pasquotank County, North Carolina (Hertford County Deed Book [HCDB] 63:178). J. W. Foreman then conveyed the land to Camilla Foreman Daniels; in 1976 she sold the land to Champion International (HCDB 377:458).

Previous Archaeological Investigations In and Near the Project Tract

At least four archaeological investigations occurred in or near the project tract prior to the present survey. These investigations include three research projects and one compliance related

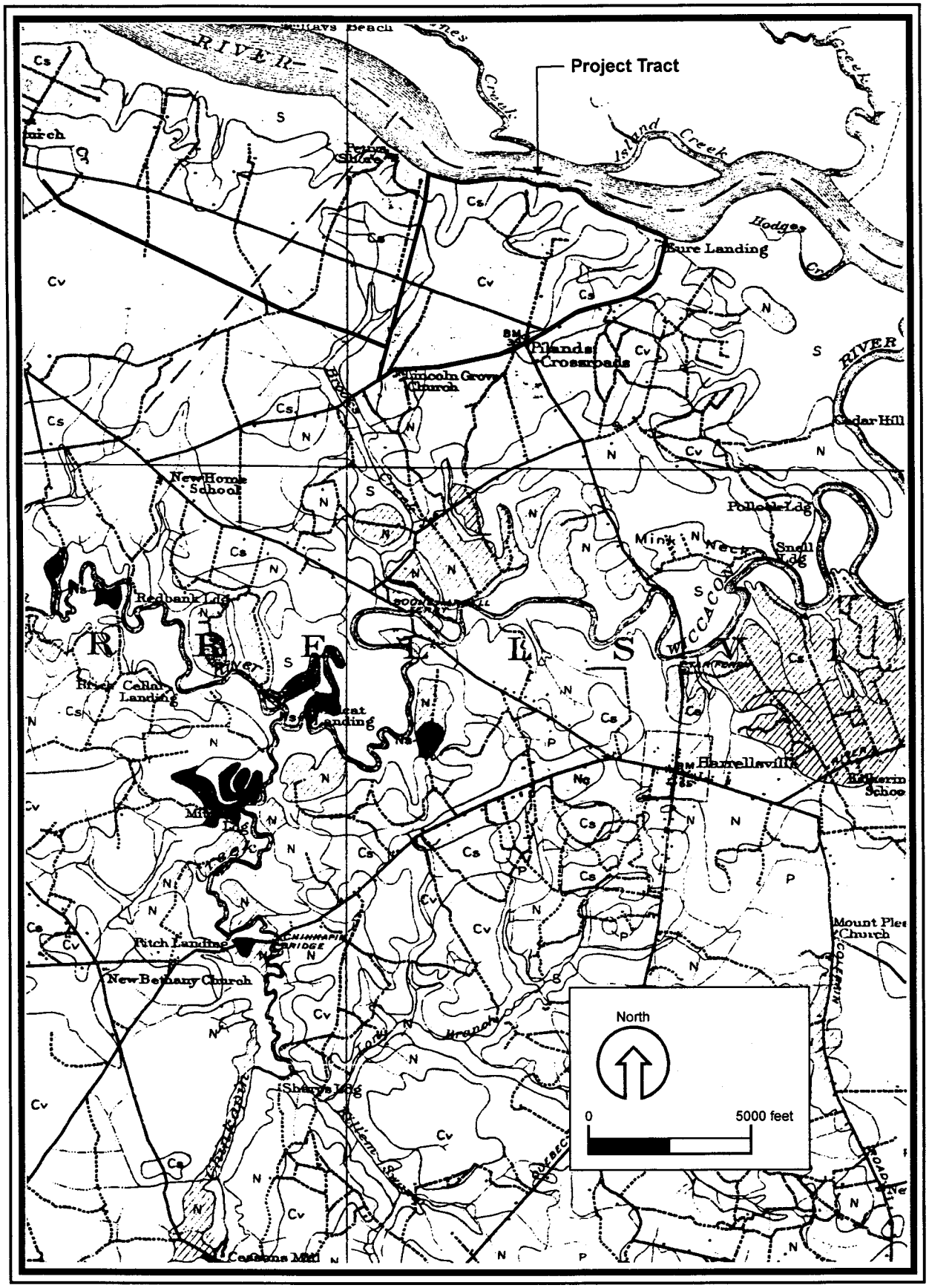

Figure 6. Soil Survey Map of Hertford County, North Carolina (1916) showing the project tract.

survey. Each of these investigations is summarized below. Also, the large surveys in the Coastal Plains of North Carolina and South Carolina that formed the basis for the definition of areas of high and low potential within the project tract are summarized.

The earliest documented archaeological investigation of a portion of the project tract is Lewis Binford's (1961) examination of 31HF11. Lewis Binford visited 31HF11 during research for his Ph.D. dissertation, recording the site as the reported location of Ohauneeck, a Late Woodland/protohistoric Chowanoac settlement. His interpretation of the historic maps suggested that the town of Ohauneeck likely was located upstream from 31HF11. Site location maps in the NCOSA originally indicated that 31HF11 was located to the east of the project tract. However, review of sketch maps attached to the original site form and the description of the site location clearly indicated the location of the site in the northwest corner of the project tract near Pettys Shore. The NCOSA maps were revised to reflect this more accurate location.

Wilson (1977) conducted a surface survey of the Chowan River valley as part of a University of North Carolina project to examine the early history of Bertie, Chowan, Gates, Hertford, Martin, and Perqimans Counties. The bank lines of the Chowan River were examined on foot and all observed artifact occurrences were recorded as archaeological sites. A total of 122 sites were recorded, including 31HF26 and 31HF27** in the project tract. Site 31HF26 is a scatter of prehistoric artifacts in a field; no diagnostic materials were observed. This site was relocated during the present survey. Site 31HF27** was recorded as a historic house site with a standing chimney. The site had been disturbed by modern road construction and agricultural activities in 1977. No evidence of this site was encountered in the reported location during the present survey.

Green (1986) conducted extensive excavations at 31HF24 and 31HF33, located to the east and downstream from the project tract. These sites appear to be the actual location of Ohauneeck. This project was designed to document Late Woodland/protohistoric Native American settlement in greater detail as support of the four hundredth anniversary of the European colonizing efforts that would lead to the creation of the United States of America. Green's (1986) excavations at 31HF24 and 31HF33 recovered over 100,000 Native American artifacts. These artifacts included ceramic sherds associated with all phases of Woodland occupation in the northern Coastal Plain of North Carolina. Detailed analyses of the ceramic and lithic artifacts were undertaken to describe the artifact assemblages associated with each of the primary components present at these sites. These

descriptions, including ceramic type descriptions, were very useful for the identification and analysis of prehistoric ceramics recovered from sites in the project tract.

Sheitlin et al. (1979) documented an intensive survey of the Ahoskie By-Pass conducted for the North Carolina Department of Transportation. This survey identified 23 sites in and around Ahoskie, to the south and west of the project tract. An excellent summary of the cultural history of Hertford County and interpretations of settlement patterns by temporal and cultural periods is presented. This information was useful for developing expectations for site location and type near the project tract, and for the interpretation of identified archaeological sites.

Hay et al. (1982) examined different models for archaeological site locations in New Hanover County, North Carolina. These models included one based on the locations of known sites in the county and more rigorously developed models based on the results of probabilistic surveys that included site locations and non-site locations. Soil fertility and drainage characteristics were the primary variables employed to describe site location potential. A regression analysis model was developed that employed 300 by 600 ft (100 by 200 m) quadrats as the sample unit. This model proved highly effective in calculating the probability that an archaeological site was likely to be present within the sample unit. Hay et al. (1982) recommended that similar models be employed rather than the intuitive and descriptive models commonly employed to stratify survey areas throughout the Southeast.

Poplin et al. (1992) examined the distributions of known sites at Marine Corps Base Camp Lejeune in Onslow County, North Carolina, to develop estimates of site densities by soil types. These estimates were employed to produce a model of prehistoric site location throughout the military reservation that could be utilized to predict when cultural resources could be affected by military activities on the base. A sample survey of areas associated with soil types with high, medium, and low densities of archaeological sites and high densities of military use then was undertaken to assess the developed model. The results of this survey indicated that nearly 99 percent (148 of 150) of all sites at Camp Lejeune occur on anhydric soils. This number is slightly inflated due to the inclusion of sites identified during previous reconnaissance level surveys (i.e., surveys that examined only high potential areas). However, the results of the sample survey also indicated a high correlation between archaeological sites and anhydric soils (97 percent/74 of 76 on anhydric soils).

Four studies in coastal South Carolina also contributed information concerning the expected locations of archaeological sites or the effect of modern silviculture practices on archaeological sites. Three of these studies examined large parcels of land owned by Union Camp Corporation or included examinations of extensive portions of the Coastal Plain. Although quite distant from the current project tract, the areas examined during all four of these studies are quite similar in setting to the NUCOR Steel Company plate mill tract.

Eubanks et al.'s (1993) survey the of Sun City - Hilton Head Development Tract in Beaufort County, South Carolina examined approximately 5,000 acres (2,024 ha) of uplands between the upper reaches of the New River and the Okatie River in Beaufort and Jasper Counties. The tract was a portion of the timberlands owned and managed by Union Camp Corporation. This tract was divided into high and low potential areas for archaeological sites on the basis of soil conditions (anhydric vs. hydric types) and distance to and above a mapped water source. Anhydric soils were defined primarily on the depth of the seasonal high water table. Eleven archaeological sites were identified during the survey. For the most part, multicomponent prehistoric sites occurred on anhydric soils. The presence of small bays and swamps throughout the tract assured that most sites were within 600 ft (200 m) of a water source. Subsequent testing of five sites in the Sun City - Hilton Head Tract revealed the extent to which silviculture practices can disrupt archaeological deposits (Eubanks and Poplin 1995).

Hill et al. (1994) conducted an extensive analysis of the locations of known archaeological sites in Beaufort County, South Carolina, to develop a model of prehistoric and historic site location for Union Camp Corporation's 18,000 acre (7,287 ha) Palmetto Bluff Tract. This analysis was undertaken to provide Union Camp with information for planning tract use. All known sites in an area covered by the nine USGS quadrangles that contained or adjoined the Palmetto Bluff Tract were included in the analysis. Soil conditions (as described by the agricultural capability class of soil types and the depth to the seasonal high water table) and distance to mapped water sources were employed to describe the locations of all known sites. Drier soils within 1,000 ft (300 m) of a water source were expected to contain nearly 91 percent of all sites on the tract. A sample survey of 500 acres (202 ha) that included portions of the high, moderate, and low potential areas was conducted; 55 percent of the discovered sites were located in high potential areas and nine percent were located in moderate potential areas.

Eubanks and Poplin (1994) employed soil conditions and distance to water as discriminating characteristics for their survey of the 3,408 acre (1,380 ha) Mary's Island Plantation Tract on the Ashepoo River in Colleton County, South Carolina. Anhydric soil conditions and distance to water were employed to define high, moderate, and low potential areas for prehistoric sites in the tract. A sample survey of the tract examined nearly all of the high or moderate potential areas and approximately 20 percent of the low potential areas; the remaining portions of the tract were examined at a reconnaissance level. Sixteen sites were identified during the survey; nine contained prehistoric components. The distributions of these sites suggested that prehistoric site locations were not related to anhydric soil conditions as defined in the model. Distance to water and the depth of the seasonal high water table appeared better indicators of where prehistoric sites were present.

Chapter III. Results of the Investigations

A cultural resources survey of NUCOR Steel Company's proposed Hertford County plate mill tract and associated infrastructure corridor identified 12 archaeological sites (31HF11, 31HF26, and 31HF215-31HF224), 18 isolated finds (31HF225-31HF236 and 31HF238-31HF243**), and three underwater magnetic anomalies (Chowan A-C). Detailed descriptions of these resources are presented below. Figures 1 and 3 display the locations of the terrestrial archaeological sites and isolated finds; the locations of underwater magnetic anomalies are displayed in Figure 1 and in Appendix A.

Due to severe disturbance, all but one of the terrestrial sites and isolated finds are recommended not eligible for the NRHP. Site 31HF223 may contain intact prehistoric archaeological deposits. Site 31HF223 is recommended potentially eligible for the NRHP. Two of three magnetic anomalies (Chowan B and Chowan C) appear to represent small isolated ferrous artifacts; Chowan A produced a larger magnetic signature and may represent the remains of a small vessel. Magnetic anomaly Chowan A should be avoided by construction activities until the nature of this concentration of ferrous materials has been determined.

Historic modifications to the project tract are evidenced by disturbance from silviculture and agriculture. Additional disturbance from erosion associated with these activities is evidenced on the tract as well. Intensive silviculture includes deep plowing or turbation of the upper 1-3 ft (0.3-0.9 m) of soil deposits. After plowing, soils are raked into narrow beds in which pine seedlings are planted. Lumps of clay are present throughout much of the project tract, indicating that the plowing has extended well into the subsoil. Similar silviculture practices on tracts owned by the Union Camp Corporation in southern South Carolina have altered artifact-bearing deposits to the extent that no intact deposits or soil features remain (Eubanks and Poplin 1994; Eubanks et al. 1993). Similarly, deep plowing of agricultural fields also has occurred in many portions of the tract. These activities have resulted in the disruption of archaeological deposits at most sites in the project tract and the dislocation and fragmentation of artifacts. The numerous isolated finds, most of which consist of a single prehistoric residual sherd, and the frequency of eroded and residual sherds in the identified archaeological sites attest to the effects of these activities. In addition, intensive survey of the reported location of 31HF27** did not recover any artifacts or evidence of this site. In 1977, the site contained a standing chimney. It is likely that all evidence of 31HF27** has been destroyed or displaced by timber management practices during the 1980s and 1990s.

Terrestrial Archaeological Sites and Isolated Finds

Site 31HF11

Cultural Affiliation *- Early Woodland, Middle Woodland, Late Woodland, unknown Historic*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *-650 ft N/S by 1,025 ft E/W (198 by 313 m)*
Soil Type *- Leaf loam*
Elevation *- 30 ft (9.1 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF11 originally was recorded by Lewis Binford in 1957 as a possible location of Ohauneeck, a protohistoric Chowanoac settlement. Previous investigations at this site recovered early European ceramics and prehistoric shell tempered ceramics that suggested a contact period settlement. During the present survey, Deep Creek, Mt. Pleasant, and Cashie ceramics were recovered. These types suggest that 31HF11 was occupied throughout the Woodland periods. No temporally diagnostic artifacts of European manufacture were recovered.

Site 31HF11 lies on the Chowan River bluff near the northwest corner of the project tract (Figures 1 and 3). Small drainages flowing into the Chowan River effectively form the eastern and western boundaries of the site. The site lies in an area of planted pines and hardwoods; a small dirt road enters the site at its northeast corner. The site covers approximately 650 by 1,025 ft (98 by 313 m). Figure 7 presents a plan of 31HF11.

A total of 68 shovel tests were excavated in and around the site; 32 produced artifacts. These shovel tests consistently revealed a gray sandy clay Ap horizon 0-0.7 ft (0-20 cm) below surface (bs). A pale brown clay Bt horizon extends 0.7-1.4+ ft (20-40+ cm) bs. This is consistent with Leaf loam identified for this area by Kirby (1984). All artifacts were recovered from the surface of the dirt road and from the Ap horizon in all shovel tests. No evidence of intact buried cultural deposits or soil features was encountered in any test.

Prehistoric artifacts recovered from 31HF11 include Deep Creek, Mt. Pleasant, and Cashie ceramics and lithic debitage from quartzite, quartz, and metavolcanic rocks. One tin button was recovered from the surface of the small dirt road in the northeast corner of the site (see Figure 7). Table 3 summarizes the artifacts recovered from 31HF11. The artifacts recovered during the present investigations suggest the site was occupied briefly during the Early Woodland (Deep Creek) period

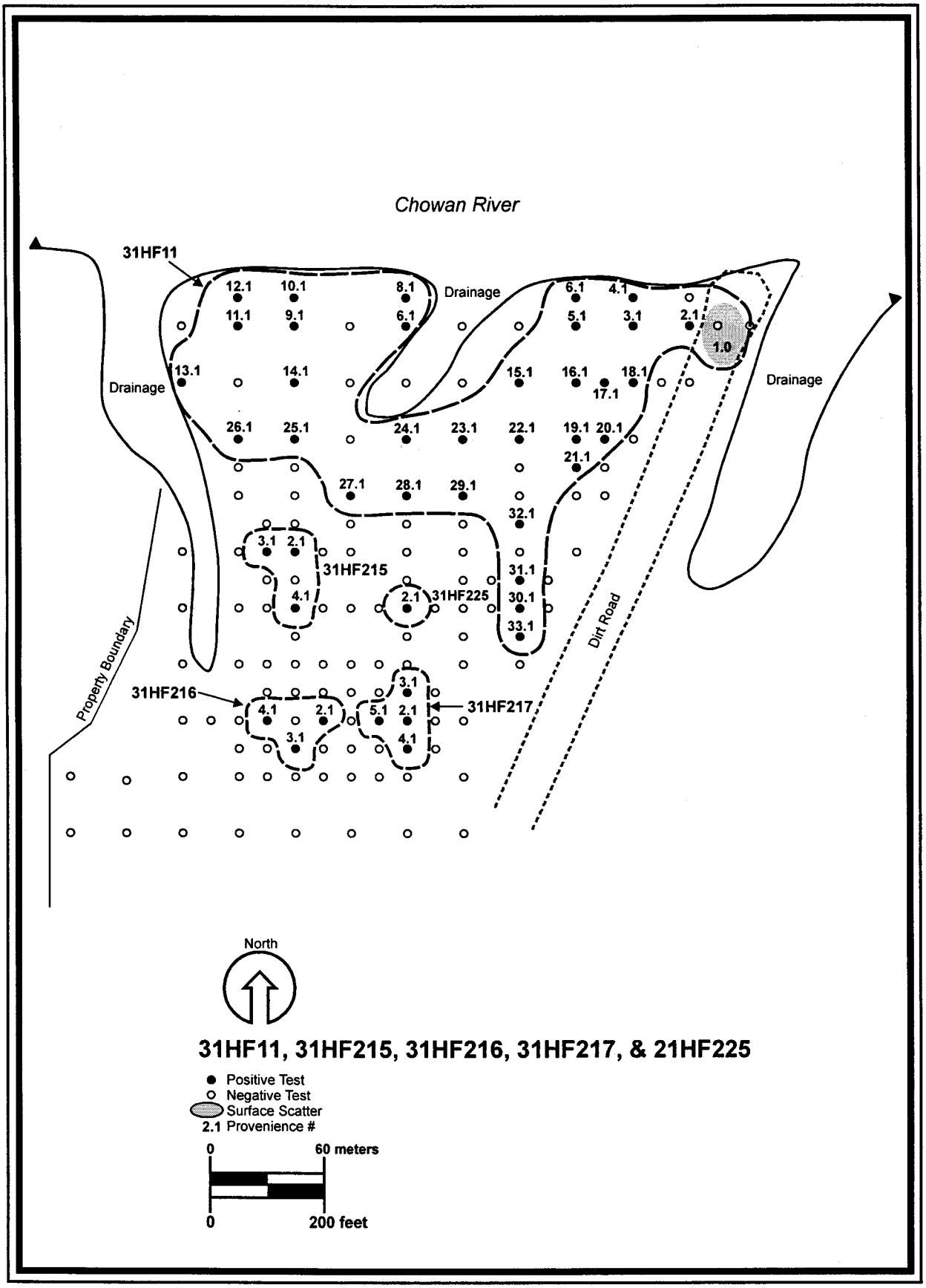

Figure 7. Plans of 31HF11, 31HF215, 31HF216, 31HF217, and 31HF225.

Table 3. Artifacts Recovered from 31HF11.

Artifact	Number
Cashie Simple Stamped sherds	5
Mt. Pleasant Fabric Impressed sherds	2
Mt. Pleasant Net Impressed sherds	1
Mt. Pleasant Cord Marked sherds	2
Deep Creek Fabric Impressed sherds	1
unidentifiable sand tempered sherds	5
residual sherds	39
quartz debitage	20
metavolcanic debitage	11
quartzite debitage	7
unidentifiable tin button	1
Total	94

and more intensively during the Middle Woodland (Mt. Pleasant) and Late Woodland (Cashie) periods. Cashie ceramics commonly are associated with Tuscarora, Meherrin, or Nottoway occupations during the Late Woodland period on the Inner Coastal Plain. No examples of seventeenth or eighteenth century European artifacts were recovered from the site during the present investigations. Interpretation of 31HF11 as the former Chowanoac town of Ohauneeck based on the artifacts recovered during the present investigations is very tenous.

The number and diversity of artifacts recovered from the site and their wide distribution suggest that 31HF11 likely was used as a residential camp during all periods of occupation. The site likely was occupied for a few days or weeks by one or more family-based groups of hunter-gatherers. Resources available in the Chowan River valley, the adjoining drainages, and uplands could be acquired with ease from 31HF11. Due to the disturbed nature of the deposits at this site and the apparent lack of cultural features, additional interpretation is not possible.

NRHP Eligibility Assessment. Site 31HF11 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF11 has produced few temporally or culturally diagnostic artifacts. The majority of the artifacts recovered during the present investigations were eroded or residual ceramic sherds or small lithic fragments. No evidence of subsurface features or buried intact artifact deposits was encountered. Twentieth century silviculture and agriculture appear to have disrupted the artifact bearing deposits at 31HF11 to such an extent that it is unlikely that the site can generate any information beyond that

recovered to date. Site 31HF11 is recommended not eligible for the NRHP. Further management consideration of 31HF11 is not warranted. Proposed land disturbing activities within this site should be allowed to proceed as planned.

Site 31HF26

Cultural Affiliation *- Early Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *- 180 ft N/S by 90 ft E/W (55 by 27 m)*
Soil Type *- Craven fine sandy loam*
Elevation *- 33 ft (10 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF26 was originally recorded during Wilson's (1977) survey of the Chowan River valley. Wilson (1977) identified the site as a prehistoric scatter of unknown age. During the present survey, a single Deep Creek ceramic sherd was recovered, suggesting that 31HF26 was occupied during the Early Woodland period.

Site 31HF26 is located in former agricultural fields in the northeast corner of the project tract. A small unnamed tributary of the Chowan River lies to the west of the site; Bazemore Road lies to the east. The site covers approximately 180 by 90 ft (55 by 27 m). Sixteen shovel tests were excavated in and around 31HF26; two shovel tests produced eight prehistoric artifacts. Figure 8 displays a plan of 31HF26.

Shovel tests at 31HF26 consistently revealed a gray sandy clay Ap horizon 0-0.8 ft (0-25 cm) bs. Below this is dark gray clay subsoil. This is consistent with the Craven fine sandy loams identified in this area by Kirby (1984). All artifacts were recovered from the Ap horizon. No evidence of buried cultural deposits or soil features was encountered in any shovel test.

Artifacts recovered from 31HF26 include four prehistoric ceramic sherds, including one Deep Creek Cord Marked sherd, and four lithic debitage fragments. Table 4 summarizes the artifacts recovered from 31HF26. The presence of a Deep Creek sherd suggests that 31HF26 was occupied during the Early Woodland period. The low frequency of artifacts at 31HF26 suggests that the site was occupied for short periods of time by small groups of people. The site may have been occupied during the procurement of resources available in the Chowan River valley or the nearby drainage.

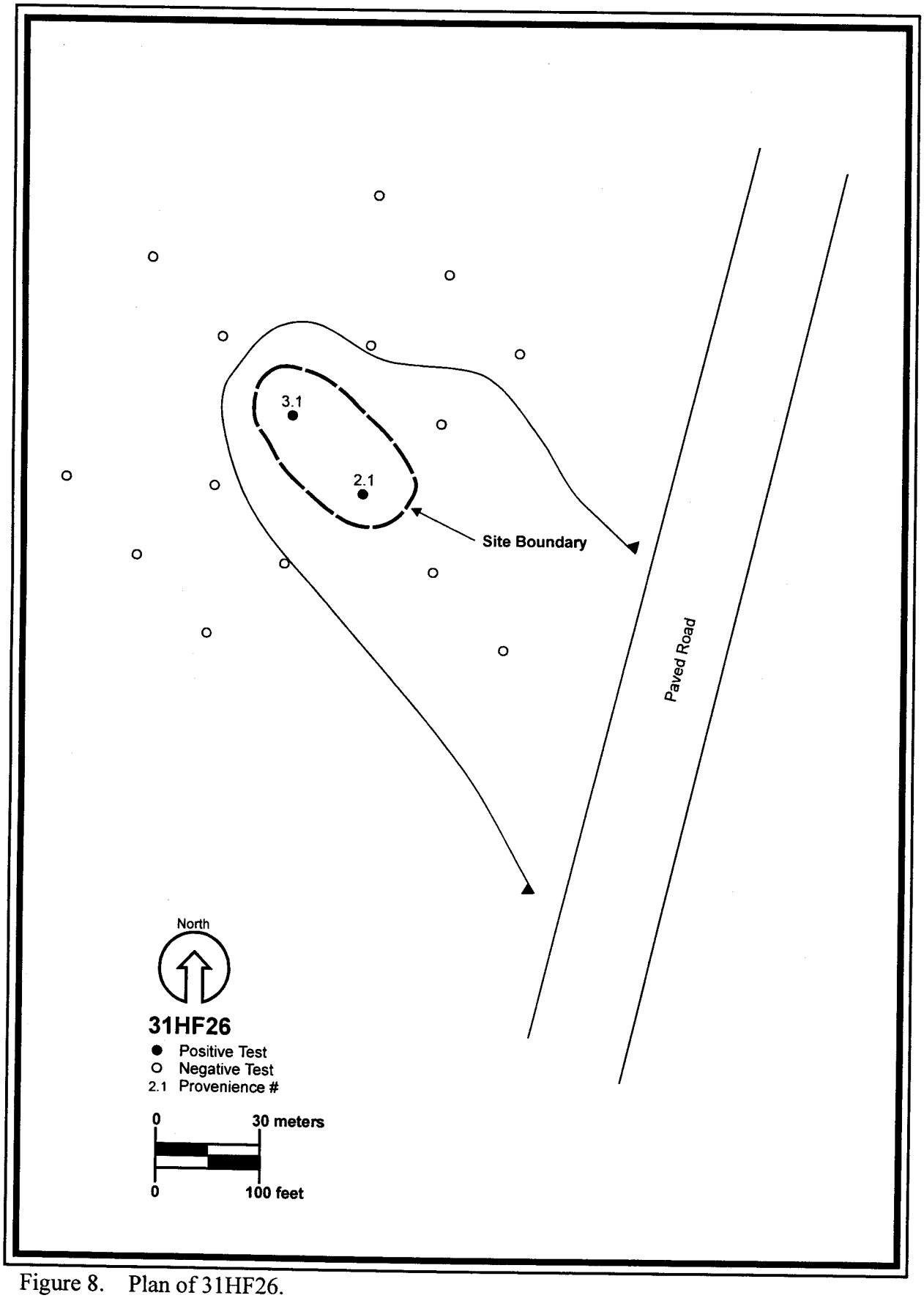

Figure 8. Plan of 31HF26.

Table 4. Artifacts Recovered from 31HF26.

Artifact	Number
Deep Creek Cord marked sherds	1
coarse sand tempered sherd (eroded)	2
residual sherds	1
orthoquartzite flakes	3
translucent quartz debitage	1
Total	8

Given the disturbed nature of the site and the lack of cultural features, no additional interpretation of 31HF26 is possible.

NRHP Eligibility Assessment. Site 31HF26 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF26 is a small diffuse scatter of prehistoric ceramics and lithics. The small number of artifacts recovered from the site cannot generate additional information concerning the function of the site. The site appears to contain no buried intact cultural deposits or subsurface soil features. Agricultural activities at 31HF26 appear to have severely disrupted the artifact bearing deposits at the site. The site cannot generate any information beyond that recovered to date. Site 31HF26 is recommended not eligible for the NRHP. Further management consideration of 31HF26 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Site 31HF215

Cultural Affiliation *- Unknown Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions- *175 ft N/S by 125 ft E/W (53 by 38 m)*
Soil Type *- Leaf loam*
Elevation *- 33 ft (10 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF215 is located on a large ridge in the northwest corner of the project tract (Figures 1 and 3). The site overlooks the Chowan River to the north and unnamed drainages to the east and west. The site, a small diffuse scatter of prehistoric lithic debitage and ceramic sherds, covers approximately 175 by 125 ft (53 by 38 m). The site area is covered in planted pines and hardwoods,

and has witnessed extensive modification as a result of silviculture practices. Figure 7 displays a plan of 31HF215.

Seventeen shovel tests were excavated in and around 31HF215; three of these shovel tests produced five artifacts. Shovel tests consistently revealed a gray sandy clay Ap horizon 0-0.7 ft (0-20 cm) bs. Below this is a pale brown clay Bt horizon 0.7-1.3+ ft (20-40+ cm) bs. This is consistent with the Leaf loam identified for this area by Kirby (1984). All artifacts were recovered from the sandy clay Ap horizon. No evidence of buried intact cultural deposits or subsurface soil features was encountered in any shovel test.

Artifacts recovered from 31HF215 include one prehistoric ceramic pipe fragment, one residual sherd, and three lithic flakes. Most of these artifacts are temporally non-diagnostic, although the ceramic pipestem suggests a general Woodland affiliation. The small number of artifacts recovered from 31HF215 suggests that the site was occupied briefly during the procurement or processing of resources from the Chowan River, the nearby drainages, and the adjoining uplands. Alternatively, the site may represent artifacts displaced from 31HF11. The site area displays extensive modification as a result of recent silviculture activities and lies immediately south of 31HF11. Given the disturbed nature of the deposits at this site, the small number of artifacts, and the lack of cultural features, no additional interpretation of this site is possible.

NRHP Eligibility Assessment. Site 31HF215 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF215 contains very few artifacts; a ceramic pipestem suggests Woodland site use. The site area has witnessed severe disturbance due to silviculture practices. It is highly unlikely that any intact cultural deposits or subsurface soil features remain at 31HF215. It is unlikely that this site can contribute meaningful information beyond that recovered to date. Site 31HF215 is recommended not eligible for the NRHP. Further management consideration of 31HF215 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Site 31HF216

Cultural Affiliation *- Unknown Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *-125 ft N/S by 175 ft E/W (38 by 53 m)*
Soil Type *- Leaf loam*
Elevation *- 33 ft (10 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF216 is located on a large ridge in the northwest corner of the project tract (Figures 1 and 3). The site overlooks the Chowan River to the north and unnamed drainages to the east and west. The site, a small diffuse scatter of prehistoric lithic debitage and ceramic sherds, covers an area approximately 125 by 175 ft (38 by 53 m). The site area is covered in planted pines and hardwoods, and has witnessed extensive modification as a result of silviculture practices. Figure 7 displays a plan of 31HF216.

Twenty-five shovel tests were excavated in and around 31HF216; three of these shovel tests produced 10 artifacts. Shovel tests consistently revealed a gray sandy clay Ap horizon 0-0.7 ft (0-20 cm) bs. Below this is a pale brown clay Bt horizon 0.7-1.3+ ft (20-40+ cm) bs. This is consistent with the Leaf loam identified in this area by Kirby (1984). All artifacts were recovered from the sandy clay Ap horizon. No evidence of buried intact cultural deposits or subsurface soil features was encountered in any shovel test.

Artifacts recovered from 31HF216 include seven prehistoric ceramic fragments (one plain and six eroded/residual sherds) and three lithic flakes. None of these artifacts are temporally diagnostic although the presence of ceramics suggests a general Woodland affiliation. The small number of artifacts recovered from 31HF216 suggests that the site was occupied briefly during the procurement or processing of resources from the Chowan River, the nearby drainages, or the adjoining uplands. Alternatively, the site may represent artifacts displaced from 31HF11. The site area displays extensive modification as a result of recent silviculture practices and lies immediately south of 31HF11. Given the disturbed nature of the deposits at this site, the small number of artifacts, and the lack of cultural features, no additional interpretation of this site is possible.

NRHP Eligibility Assessment. Site 31HF216 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF216 contains very few artifacts; none are temporally or culturally diagnostic. The site area has

witnessed severe disturbance as a result of silviculture practices. It is highly unlikely that any intact cultural deposits or subsurface soil features remain at 31HF216. It is unlikely that this site can contribute meaningful information beyond that recovered to date. Site 31HF216 is recommended not eligible for the NRHP. Further management consideration of 31HF216 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Site 31HF217

Cultural Affiliation *- Unknown Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *- 175 ft N/S by 125 ft E/W (53 by 38 m)*
Soil Type *- Leaf loam*
Elevation *- 33 ft (10 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF217 is located on a large ridge in the northwest corner of the project tract (Figures 1 and 3). The site overlooks the Chowan River to the north and unnamed drainages to the east and west. The site, a small diffuse scatter of ceramic sherds, covers an area approximately 175 by 125 ft (53 by 38 m). The site area is covered in planted pines and hardwoods, and has witnessed extensive modification as a result of silviculture practices. Figure 7 displays a plan of 31HF217.

Seventeen shovel tests were excavated in and around 31HF217; four of these shovel tests produced five artifacts. Shovel tests consistently revealed a gray sandy clay Ap horizon 0-0.7 ft (0-20 cm) bs. Below this is a pale brown clay Bt horizon 0.7-1.3+ ft (20-40 cm) bs. This is consistent with the Leaf loam identified in this area by Kirby (1984). All artifacts were recovered from the sandy clay Ap horizon. No evidence of buried intact cultural deposits or subsurface soil features was encountered in any shovel test.

Artifacts recovered from 31HF217 include seven eroded/residual sherds. None of these artifacts are temporally diagnostic although the presence of ceramics suggests a general Woodland affiliation. The small number of artifacts recovered from 31HF217 suggests that the site was occupied briefly during the procurement or processing of resources from the Chowan River, the nearby drainages, and the adjoining uplands. Alternatively, the site may represent artifacts displaced from 31HF11. The site area displays extensive modification as a result of recent silviculture activities and lies immediately south of 31HF11. Given the disturbed nature of the deposits at this

site, the small number of artifacts, and the lack of cultural features, no additional interpretation of this site is possible.

NRHP Eligibility Assessment. Site 31HF217 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF217 contains very few artifacts; none are temporally or culturally diagnostic. The site area has witnessed severe disturbance as a result of silviculture practices. It is highly unlikely that any intact cultural deposits or subsurface soil features remain at 31HF217. This site cannot be expected to contribute meaningful information beyond that recovered to date. Site 31HF217 is recommended not eligible for the NRHP. Further management consideration of 31HF217 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Site 31HF218

Cultural Affiliation *- Early Woodland, unknown Historic*
Site Type *- Ceramic and lithic scatter, unidentifiable nail fragment*
Site Dimensions *-275 ft N/S by 275 ft E/W (84 by 84 m)*
Soil Type *- Leaf loam*
Elevation *- 33 ft (10 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF218 is located on an upland flat approximately 1,250 ft (380 m) south of the Chowan River (see Figures 1 and 3). A dirt access road curves along the east and northern edges of the site. One of the unnamed tributaries of the Chowan River that dissects the northern portion of the project tract rises immediately north of 31HF218. Mixed pine and hardwood forest covers the site area. The site, a diffuse scatter of prehistoric ceramics and lithic debitage, covers an area approximately 275 by 275 ft (84 by 84 m). Figure 9 presents a plan view of 31HF218.

Thirty-five shovel tests were excavated in and around the site; five of these shovel tests produced nine artifacts and 1.0 g of faunal material. Shovel tests at 31HF218 consistently revealed a gray sandy clay Ap horizon 0-0.8 ft (0-25 cm) bs. Below this is a pale brown clay Bt horizon. This is consistent with Leaf loam identified for this area by Kirby (1984). Artifacts were recovered from the Ap horizon only. No evidence of buried intact cultural deposits or subsurface soil features was encountered in any shovel test.

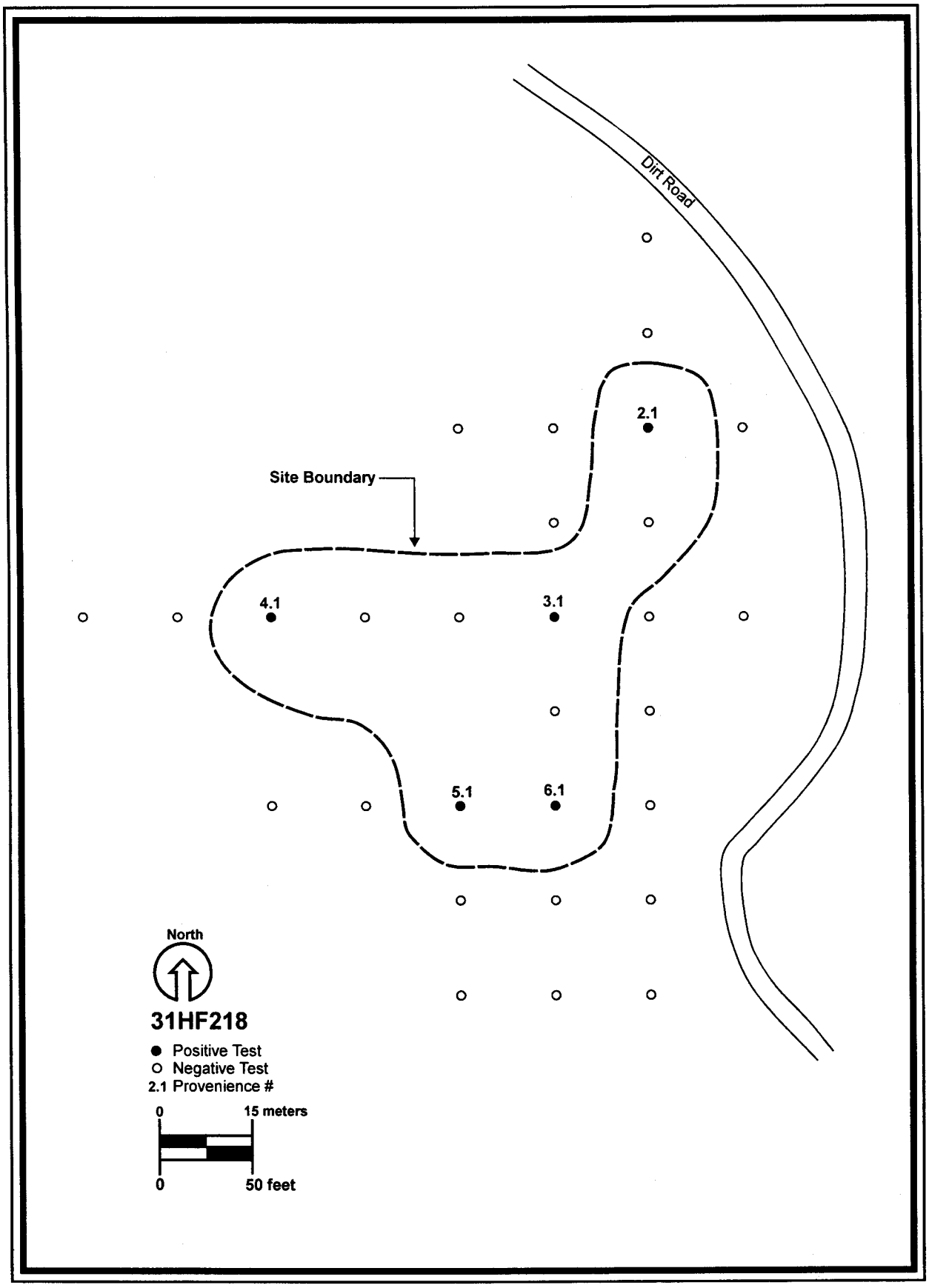

Figure 9. Plan of 31HF218.

Artifacts recovered from 31HF218 include six prehistoric sherds (two Deep Creek Fabric Impressed and four eroded/residual), two flake fragments, one unidentifiable nail fragment, and a tiny fragment of faunal material. The Deep Creek sherds indicate an Early Woodland occupation at 31HF218. The prehistoric artifacts recovered from 31HF218 suggest an occupation with a limited number of activities, probably related to the procurement or processing of locally available resources. The nail fragment suggests that a former structure was located near 31HF218. Alternatively, the nail may represent a more recent activity such as a hunting stand. Given the limited number of artifacts and the lack of cultural features, no additional interpretation of this site is possible.

NRHP Eligibility Assessment. Site 31HF218 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF218 is a diffuse scatter of prehistoric and historic artifacts. Relatively few diagnostic artifacts were recovered from the site. The remaining artifacts are small or severely eroded. One unidentifiable nail fragment is the only historic artifact recovered from the site. There is no evidence of archaeological features or intact artifact deposits. It is unlikely that this site can contribute meaningful information beyond that recovered to date. Site 31HF218 is recommended not eligible for the NRHP. Further management consideration of 31HF218 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Site 31HF219

Cultural Affiliation *- Early Woodland, Middle Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *- 695 ft N/S by 720 ft E/W (212 by 220 m)*
Soil Type *- Craven fine sandy loam*
Elevation *- 33 ft (10 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF219 is located on the bluff overlooking the Chowan River in the north central portion of the project tract (see Figures 1 and 3). The site is bounded to the east and west by small drainages that flow into the Chowan River. A similar drainage is in the central portion of the site. Artifacts are scattered over the crest of the ridges that separate these drainages. The site area is covered in mixed pine and hardwood forest with very dense ground cover. Like the remainder of the northern portion of the tract, the site area has witnessed extensive silviculture practices. This has resulted in severe disturbances to the soil horizons in and around 31HF219. This large site,

containing prehistoric ceramics and lithic artifacts, covers an area approximately 695 by 720 ft (212 by 220 m). Figure 10 displays a plan of 31HF219.

A total of 120 shovel tests were excavated in and around 31HF219; 41 of these shovel tests produced artifacts. Shovel tests at 31HF219 consistently revealed a gray sandy loam Ap horizon 0-0.8 ft (0-25 cm) bs. Below this is a pale brown sandy clay Bt horizon 0.8-1.3+ ft (25-40+ cm) bs. This is consistent with the Craven Fine Sandy Loam soils identified in this area by Kirby (1984). Artifacts were recovered from the Ap horizon only. No evidence of buried intact cultural deposits or subsurface soil features was encountered in any shovel test.

Artifacts recovered from 31HF219 include 90 prehistoric ceramics (including four Deep Creek Fabric Impressed and two Mt. Pleasant Fabric Impressed sherds) and 23 fragments of lithic debitage (including quartz, quartzite, and metavolcanic rocks). Table 5 summarizes the artifacts recovered from 31HF219.

Table 5. Artifacts Recovered from 31HF219.

Artifacts	Number
Deep Creek Fabric Impressed sherd	4
Mt. Pleasant Fabric Impressed sherd	2
Plain sand tempered sherd	2
Eroded sherd	8
Residual sherd	74
Quartz cobble fragment	3
Quartz flake/shatter	7
Quartzite cobble fragment	1
Quartzite flake/shatter	6
Orthoquartzite core	1
Orthoquartzite cobble fragment	2
Orthoquartzite flake/shatter	2
Metavolcanic flake	1
Total	113

Site 31HF219 produced ceramics from Early Woodland (Deep Creek) and Middle Woodland (Mt. Pleasant) occupations. The frequency and diversity of the ceramic and lithic artifacts recovered from 31HF219 suggest that it was a residential camp or a series of camps occupied during the procurement of resources from the Chowan River, the adjacent drainages, and the adjoining uplands. The number and types of artifacts and their distribution over a large area suggest that 31HF219 was

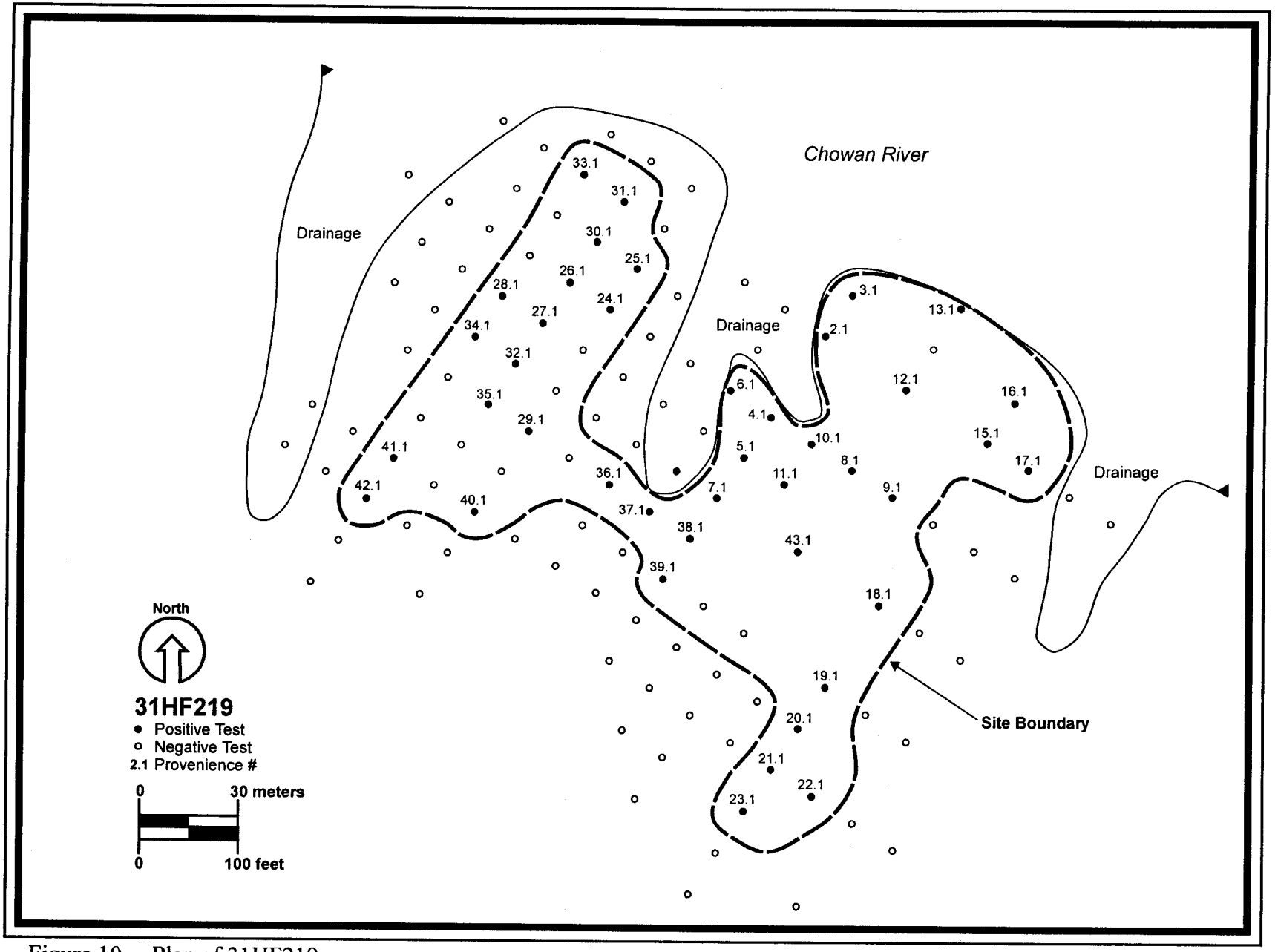

Figure 10. Plan of 31HF219.

occupied repeatedly by small groups of people during the Early and Middle Woodland periods. Relatively few diagnostic ceramics were recovered from 31HF219. The majority of the ceramics recovered from 31HF219 are small or highly eroded. Based on the poor condition of the ceramics that have been recovered from this site and the lack of cultural features, no additional interpretation of this site is possible.

NRHP Eligibility Assessment. Site 31HF219 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF219 is a large diffuse scatter of ceramic and lithic artifacts. Relatively few diagnostic artifacts were recovered from the site. The artifacts also display significant erosion and fragmentation probably as a result of the agricultural and silvicultural activities that have occurred at the site. These practices likely destroyed any archaeological features that may have been present. The disruption of the soil horizons at the site also prevents the separation of the lithic artifacts that may be associated with Early and Middle Woodland components of the site. Interpretation of the activities that occurred at the site cannot be attempted without features and separable artifact assemblages associated with each component. Thus, 31HF219 cannot generate any meaningful information beyond that recovered to date. Site 31HF219 is recommended not eligible for the NRHP. Further management consideration of Site 31HF219 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Site 31HF220

Cultural Affiliation *- Early Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *- 200 ft N/S by 175 ft E/W (60 by 53 m)*
Soil Type *- Craven fine sandy loam*
Elevation *- 33 ft (10 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF220 is located on the Chowan River bluff in the north central portion of the project tract (Figures 1 and 3). Unnamed drainages lie to the east and west of the site. A dirt access road extends along the western edge of the site. The site, a small diffuse scatter of prehistoric lithics and ceramics, covers an area approximately 200 by 175 ft (60 by 53 m). The site area is currently covered in mixed pine and hardwood forest. Furrows and beds associated with intensive silviculture are present throughout the site area. Figure 11 presents a plan of 31HF220.

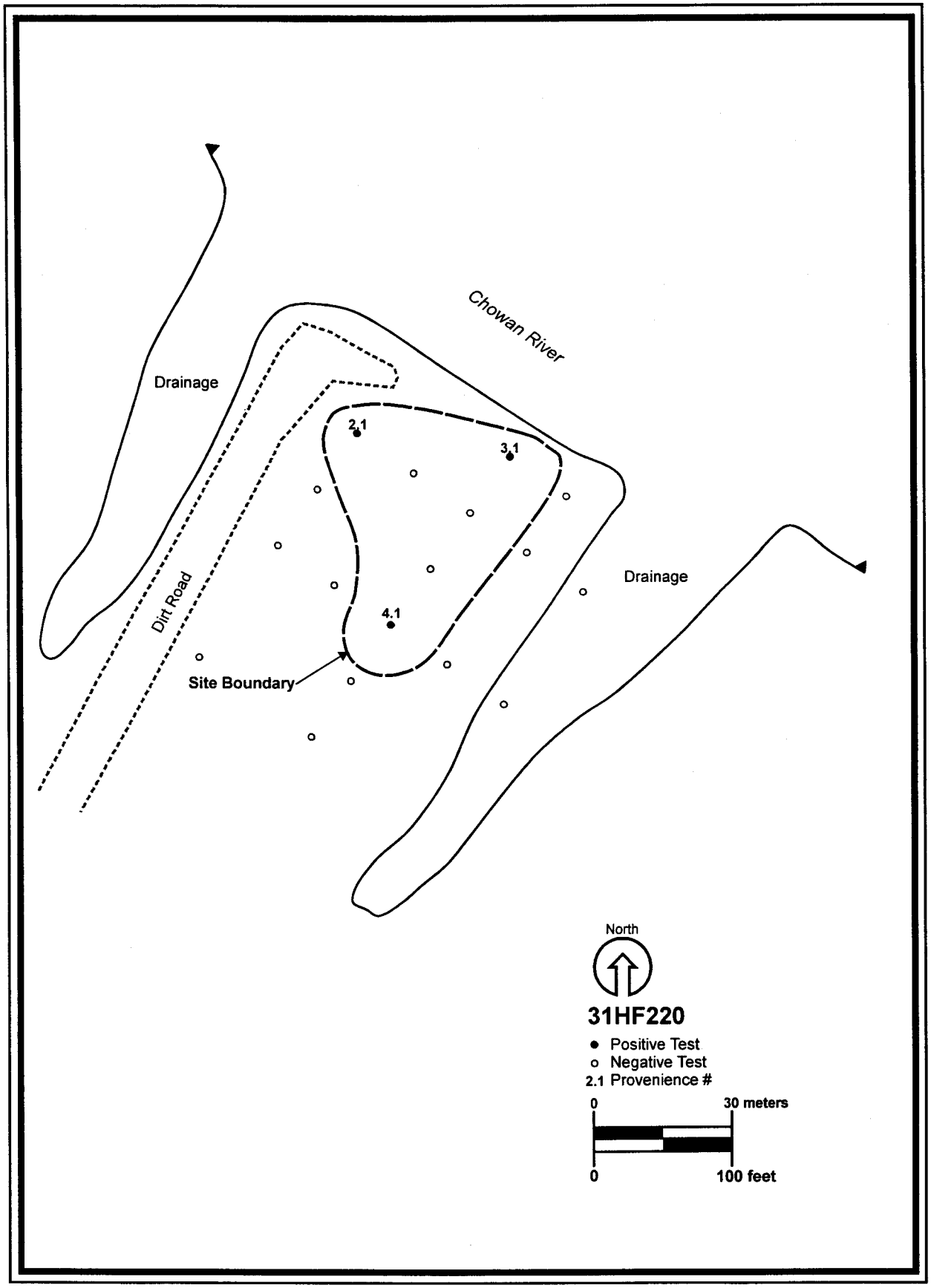

Figure 11. Plan of 31HF220.

Seventeen shovel tests were excavated in and around 31HF220; three of these tests produced nine prehistoric artifacts. Shovel tests at 31HF220 consistently revealed a gray sandy loam Ap horizon 0-0.8 ft (0-25 cm) bs underlain by a pale brown sandy clay Bt horizon 0.8-1.3+ ft (25-40 cm) bs. This is consistent with Craven fine sandy loam identified in this area by Kirby (1984). Artifacts were recovered from the Ap horizon only. No evidence of buried intact cultural deposits or subsurface soil features was encountered in any shovel test.

Artifacts recovered from 31HF220 include one Deep Creek Fabric Impressed sherd, four eroded/residual sherds, and four lithic flakes. The Deep Creek sherd indicates an Early Woodland occupation. The small number of artifacts and the limited number of artifact types suggest that this site was occupied for a short period of time, probably during the procurement of resources available in the Chowan River, the adjacent drainages, and the adjoining uplands. The small number of artifacts and the apparent disturbance of the soil horizons at 31HF220 prevent more detailed interpretations of the use of the site.

NRHP Eligibility Assessment. Site 31HF220 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF220 is a diffuse scatter of prehistoric artifacts. One diagnostic artifact was recovered from the site. The remaining artifacts are small or severely eroded. There is little potential for archaeological features and no evidence of intact artifact deposits. It is unlikely that this site can contribute meaningful information beyond that recovered to date. Site 31HF220 is recommended not eligible for the NRHP. Further management consideration of 31HF220 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Site 31HF221

Cultural Affiliation *- Early Woodland, Middle Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *- 335 ft N/S by 600 ft E/W (102 by 183 m)*
Soil Type *- Craven fine sandy loam*
Elevation *- 28 ft (8.5 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF221 is located on the bluff of the Chowan River in the northeastern portion of the project tract (Figures 1 and 3). A large unnamed drainage flows into the Chowan River along the

east side of the site. Vegetation in the site area consists of mixed pine and hardwood forest with very dense ground cover. Evidence of intensive silviculture was observed throughout the site area. This relatively large site, defined by a diffuse scatter of prehistoric ceramics and lithic artifacts, covers approximately 335 by 600 ft (102 by 183 m). Figure 12 displays a plan of 31HF221.

A total of 54 shovel tests were excavated in and around the site; 14 of these tests produced 71 artifacts. Shovel tests at 31HF221 consistently revealed a gray sandy loam Ap horizon 0-0.8 ft (0-25 cm) bs underlain by a pale brown sandy clay Bt horizon 0.8-1.3+ ft (25-40+ cm) bs. This is consistent with Craven fine sandy loam identified in this area by Kirby (1984). Artifacts were recovered from the Ap horizon only. No evidence of buried intact cultural deposits or subsurface soil features was encountered in any test.

Artifacts recovered from 31HF221 include 47 ceramic sherds (including one Deep Creek Cord Marked, one Mt. Pleasant Cord Marked, two Mt. Pleasant Fabric Impressed, and one Hanover Cord Marked) and 24 lithic fragments. Table 6 summarizes the artifacts recovered from 31HF221. The Deep Creek sherd indicates an Early Woodland occupation; the Hanover and Mt. Pleasant sherds indicate Middle Woodland occupations. The number of artifacts and their distribution over a relatively large area suggest that the site was occupied repeatedly for short periods of time during the Early and Middle Woodland periods. The presence of ceramic and lithic artifacts also suggest that 31HF221 may have served as a residential camp that was used during the procurement and processing of resources from the Chowan River, the adjacent drainage, and the adjoining uplands. The small number of diagnostic artifacts and the highly disturbed soil horizons at the site preclude additional interpretations of the function of 31HF221.

Table 6. Artifacts Recovered from 31HF221.

Artifacts	Number
Deep Creek Cord Marked sherd	1
Mt. Pleasant Cord Marked sherd	1
Mt. Pleasant Fabric Impressed sherd	2
Hanover Cord Marked sherd	1
Eroded/Residual sherd	42
Orthoquartzite flake/shatter	14
Quartz flake/shatter	7
Quartzite flake	2
Metavolcanic flake	1
Total	71

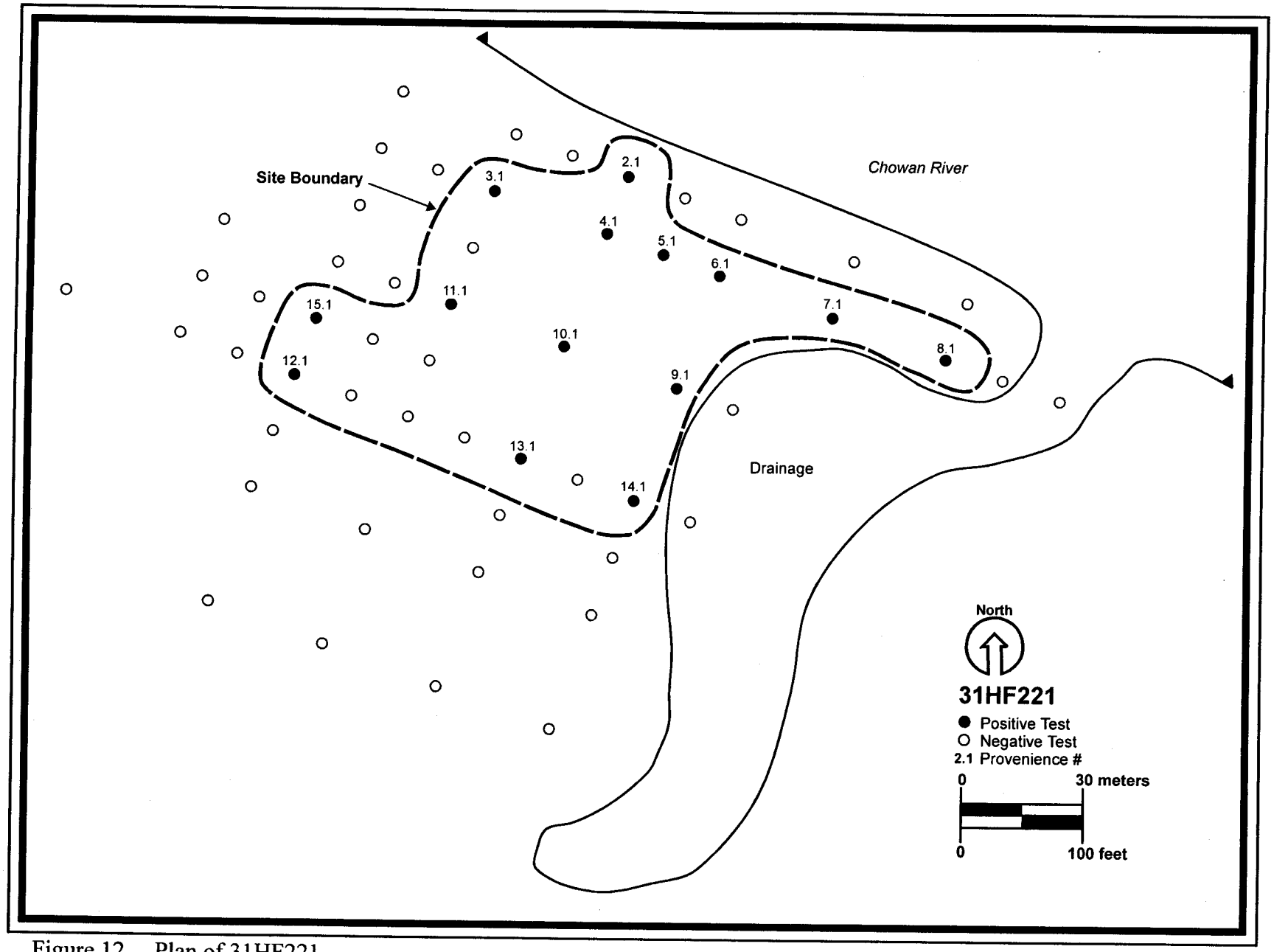

Figure 12. Plan of 31HF221.

NRHP Eligibility Assessment. Site 31HF221 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF221 is a large diffuse scatter of ceramic and lithic artifacts. Relatively few diagnostic artifacts were recovered from the site. The artifacts also display significant erosion and fragmentation probably as a result of the agricultural and silvicultural activities that have occurred at the site. These practices likely destroyed any archaeological features that may have been present. The disruption of the soil horizons at the site also prevents the separation of the lithic artifacts that may be associated with Early and Middle Woodland components of the site. Interpretation of the activities that occurred at the site cannot be attempted without features and separable artifact assemblages associated with each component. It is unlikely that this site can generate any information beyond that recovered to date. Site 31HF221 is recommended not eligible for the NRHP. Further management consideration of 31HF221 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Site 31HF222

Cultural Affiliation *- Unknown Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *- 175 ft N/S by 290 ft E/W (53 by 88 m)*
Soil Type *- Craven fine sandy loam*
Elevation *- 28 ft (8.5 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF222 is located on the bluff of the Chowan River in the north central portion of the project tract (see Figures 1 and 3). Small drainages flow into the Chowan River to the east and west of the site. Vegetation in the site area consists of mixed pine and hardwood forest with very dense groundcover. Evidence of intensive silviculture was observed throughout the site area. This relatively small site, defined by a diffuse scatter of prehistoric ceramics and one lithic flake, covers approximately 175 by 290 ft (53 by 88 m). Figure 13 displays a plan of site 31HF222.

Sixteen shovel tests were excavated in and around 31HF222; five of these tests produced 11 artifacts. Shovel tests at 31HF222 consistently revealed a gray sandy loam Ap horizon 0-0.7 ft (0-20 cm) bs underlain by a pale brown sandy clay Bt horizon 0.7-1.3+ ft (20-40+ cm) bs. This is consistent with Craven fine sandy loam identified for this area by Kirby (1984). Artifacts were

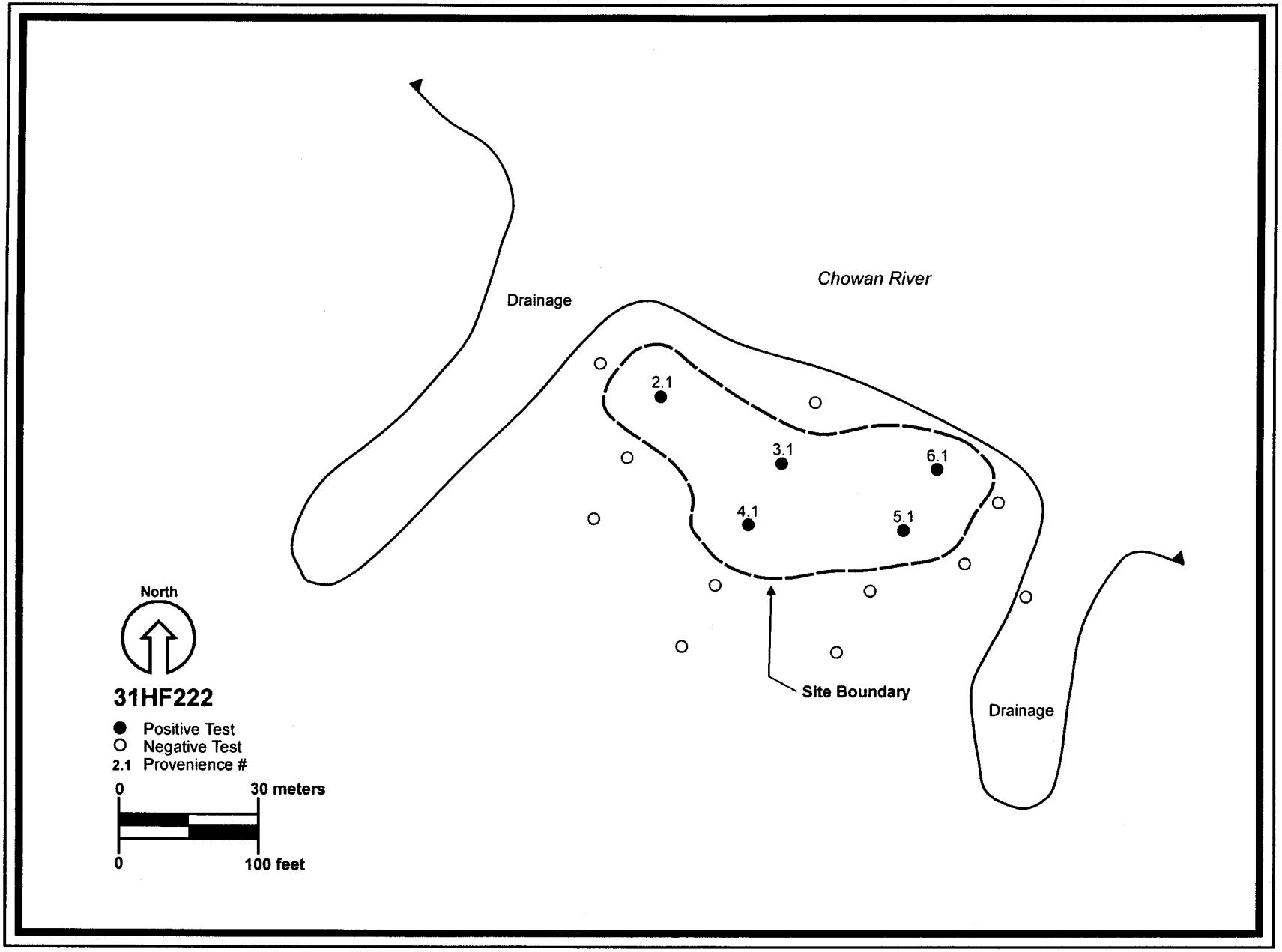

Figure 13. Plan of 31HF222.

recovered from the Ap horizon only. No evidence of buried intact cultural deposits or subsurface soil features was encountered in any test.

Artifacts recovered from 31HF222 include 10 eroded/residual sherds and one quartzite flake fragment. The presence of ceramics suggests a general Woodland occupation. The small and eroded nature of these artifacts prevents a more definitive assessment of the temporal affiliation of the site. The small number of artifacts suggests that the site may have been occupied briefly by small groups of people. Probably, the site was used during the procurement and processing of resources from the Chowan River, the adjacent drainages, and the adjoining uplands. The small number of artifacts and the highly disturbed nature of the soil horizons at 31HF222 prevent additional interpretations of the function of the site.

NRHP Eligibility Assessment. Site 31HF222 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF222 is a diffuse scatter of prehistoric artifacts. One diagnostic artifact was recovered from the site. The remaining artifacts are small or severely eroded. There is no evidence of archaeological features or intact artifact deposits. It is unlikely that this site can contribute meaningful information beyond that recovered to date. Site 31HF222 is recommended not eligible for the NRHP. Further management consideration of 31HF222 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Site 31HF223

Cultural Affiliation *- Early Woodland, Late Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *- 735 ft N/S by 840 ft E/W (224 by 256 m)*
Soil Type *- Craven fine sandy loam*
Elevation *- 33 ft (10 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Potentially Eligible / preserve or test*

Site 31HF223 is located on the bluff of the Chowan River in the northeast portion of the project tract (see Figures 1 and 3). An unnamed drainage flows to the Chowan River to the east and south of the site. Modern residential lots and a soybean field lie to the west of the site. The site area is covered by a mixed pine and hardwood forest like most of the tract; however, evidence of intensive silvicultural practices were not apparent near 31HF223. The site, defined by an extensive

processing and consumption of resources procured at many of the smaller sites identified on the project tract.

NRHP Eligibility Assessment. Site 31HF223 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF223 is an extensive scatter of prehistoric ceramic and lithic artifacts. In addition, small fragments of animal bone were recovered from two shovel tests. Site 31HF223 displayed noticeably less disturbance than was observed at any other site in the project tract. It is possible that the intensive silvicultural and agricultural activities that occurred in the other portions of the tract were not carried out at 31HF223. If so, 31HF223 may contain buried intact cultural deposits or subsurface soil features. The site appears to contain sufficient numbers and varieties of artifacts to allow identifications of specific activities that may have occurred at the site. Detailed analyses of these artifacts and the distribution of activity areas over the site may produce data that can address research questions concerning the organization and use of space within Early Woodland and/or Late Woodland settlements. Comparison of this organization to other sites in the region would contribute to the understanding of Early and Late Woodland settlement patterns. The presence of faunal remains suggests that analysis of subsistence practices and the seasonality of the occupations at the site can be determined. These data would contribute significantly to the further understanding of Early and Late Woodland subsistence strategies. Therefore, 31HF223 is recommended potentially eligible for the NRHP. Site 31HF223 should be protected from land disturbing activities until appropriate testing investigations have been conducted. Test investigations will determine definitively the NRHP eligibility of the site.

Site 31HF224

Cultural Affiliation *-Woodland*
Site Type *- Ceramic and lithic scatter*
Site Dimensions *- 80 ft N/S by 187 ft E/W (24 by 57 m)*
Soil Type *- Craven fine sandy loam*
Elevation *- 33 ft (10 m) amsl*
Nearest Water Source *- Chowan River*
Present Vegetation *- Mixed pine/hardwoods*
NRHP/Management Recommendations *- Not eligible / no further work*

Site 31HF224 is located near the bluff of the Chowan River in the northeastern portion of the project tract (see Figures 1 and 3). Residential lots and a soybean field are present to the north and west of the site; 31HF223 lies to the east. Vegetation in the site area consists of pine and hardwood

forest with dense groundcover. This small site, defined by a diffuse scatter of prehistoric ceramics and lithic artifacts, covers an area approximately 80 by 187 ft (24 by 57 m). Figure 14 displays a plan of 31HF224.

Nineteen shovel tests were excavated in and around 31HF224; two of these tests produced 10 artifacts. Shovel tests at 31HF224 consistently revealed a gray sandy loam Ap horizon 0-0.8 ft (0-25 cm) bs underlain by a pale brown sandy clay Bt horizon 0.8-1.3+ ft (25-40+ cm) bs. This is consistent with Craven fine sandy loam identified in this area by Kirby (1984). Artifacts were recovered from the Ap horizon only. No evidence of subsurface soil features was encountered in any test.

Artifacts recovered from 31HF224 include six residual prehistoric sherds and four lithic debitage fragments. The presence of ceramics suggests a general Woodland occupation. The low number of artifacts suggests limited occupation of 31HF224. Activities associated with the procurement or processing of a specific local resource may have occurred at the site. Alternatively, this site may consist of artifacts redeposited from 31HF223 by historic or modern agricultural or silvicultural practices.

NRHP Eligibility Assessment. Site 31HF224 was assessed with respect to Criterion D, its ability to add significantly to our understanding of the prehistory and history of the region. Site 31HF224 is a small diffuse scatter of nondiagnostic artifacts. The small number of artifacts suggests that few activities or activities of short duration occurred at the site. The site has witnessed some disturbance due to silvicultural and agricultural activities. It is unlikely that intact buried cultural deposits or subsurface soil features are present at 31HF224. The site appears to lack the numbers and kinds of artifacts that can generate information capable of addressing important questions concerning the prehistoric use of the site or region. It is unlikely that this site can contribute meaningful information beyond that recovered to date. Site 31HF224 is recommended not eligible for the NRHP. Further management consideration of 31HF224 is not warranted. Proposed land disturbing activities within the site should be allowed to proceed as planned.

Isolated Finds

Eighteen isolated finds (31HF225-31HF236 and 31HF238-31HF243) were identified on the project tract. These isolated finds represent locales that produced four or fewer artifacts. In most

scatter of Early and Late Woodland ceramic sherds and lithic debitage, covers an area approximately 735 by 840 ft (224 by 256 m). Figure 14 presents a plan of 31HF223.

Seventy-five shovel tests were excavated in and around 31HF223; 23 of these tests produced 110 artifacts. Shovel tests at 31HF223 consistently revealed a gray sandy loam Ap horizon 0-0.7 ft (0-20 cm) bs underlain by a pale brown sandy clay Bt horizon 0.7-1.3+ ft (20-40+ cm) bs. This is consistent with Craven fine sandy loam identified in this area by Kirby (1984). Artifacts were recovered from the Ap horizon only. No evidence of subsurface soil features was encountered in any test.

Artifacts recovered from 31HF223 include 84 ceramic sherds (including 10 Deep Creek Fabric Impressed, two Deep Creek Cord Marked, four Colington Fabric Impressed, and one pipe fragment), 22 lithic debitage fragments, and two small fragments (1.4 g) of animal bone. Table 7 summarizes the artifacts recovered from 31HF223. Sherds recovered from 31HF223 are larger than those recovered from other sites in the project tract. This may reflect less disturbance at 31HF223 when compared to the other sites in the project tract.

Table 7. Artifacts Recovered from 31HF223.

Artifact	Number
Deep Creek Fabric Impressed sherd	10
Deep Creek Cord Marked sherd	2
Colington Fabric Impressed sherd	4
plain sand tempered sherd	1
eroded/residual sherd	66
pipe fragment	1
quartz debitage	10
metavolcanic debitage	6
orthoquartzite debitage	4
quartzite debitage	2
faunal remains (1.4 g)	2
Total	110

The Deep Creek and Colington ceramics recovered from 31HF223 indicate Early Woodland and Late Woodland occupations, respectively. The distribution of the artifacts over a wide area and the variety of artifacts recovered from the site suggest that 31HF223 likely served as a residential camp during the Early Woodland and Late Woodland periods. The site appears to have been occupied repeatedly by small groups of people. It is likely that this locale was used for the

cases, these isolated finds consist of a single prehistoric residual sherd recovered from a single shovel test. In all cases, 6-10 shovel tests were excavated around the initial find in an effort to recover additional artifacts. Table 8 summarizes the isolated finds identified during this survey.

Table 8. Isolated Finds in NUCOR Steel Company's Proposed Plate Mill Tract.

Number	Component	Artifact (# of Shovel Tests)	NRHP Status
31HF225	unknown Woodland	1 residual sherd (1)	not eligible
31HF226	unknown Woodland	1 residual sherd (1)	not eligible
31HF227	unknown Woodland	1 residual sherd (1)	not eligible
31HF228**	unknown prehistoric, nineteenth-twentieth century	1 metavolcanic flake, 1 glass sherd, 1 brick fragment (1)	not eligible
31HF229	unknown Woodland	1 residual sherd, 1 metavolcanic flake (2)	not eligible
31HF230	unknown Woodland	2 eroded/residual sherd (1)	not eligible
31HF231	Early-Middle Woodland	1 Roanoke projectile point	not eligible
31HF232	unknown Woodland	1 residual sherd (1)	not eligible
31HF233	unknown Woodland	1 residual sherd (1)	not eligible
31HF234	unknown Woodland	1 residual sherd (1)	not eligible
31HF235	unknown Woodland	1 residual sherd, 1 metavolcanic flake (1)	not eligible
31HF236	unknown Woodland	2 residual sherds, 1 metavolcanic flake (3)	not eligible
31HF238	unknown Woodland	2 residual sherds, 1 metavolcanic flake (3)	not eligible
31HF239	unknown Woodland	3 residual sherds, 1 metavolcanic flake (1)	not eligible
31HF240**	nineteenth-twentieth century	1 undecorated whiteware sherd (1)	not eligible
31HF241	Early and Middle Woodland	1 Deep Creek Net Impressed sherd, 1 Mt. Pleasant Fabric Impressed, 1 residual sherd (3)	not eligible
31HF242	unknown Woodland	1 residual sherd (1)	not eligible
31HF243**	nineteenth-twentieth century	1 unidentifiable stoneware sherd, 1 undecorated ironstone sherd, 1 brick (1)	not eligible

Most of the isolated finds are located in the central portion of the project tract, farther from the Chowan River than the archaeological sites (see Figures 1 and 3). A few of the isolated finds probably represent artifacts displaced from these sites (e.g., 31HF225 may be associated with 31HF11- see Figure 7). Some of the prehistoric isolated finds undoubtedly represent locales where very limited activities occurred. These activities required few artifacts or occurred so infrequently that few artifacts were deposited at the occupied locales. The historic isolated finds appear to represent vessels that may have been lost while the owners were working in agricultural fields or harvesting timber in the project tract.

Due to the low frequencies of artifacts at these locales, the lack of cultural features, and the generally disturbed nature of the soil deposits, all of the 19 isolated finds identified in the project

tract are recommended not eligible for the NRHP. Further management consideration of these isolated finds is not warranted. Proposed land disturbing activities at these locales should be allowed to proceed as planned.

Underwater Magnetic Anomalies

Remote sensing survey of the Chowan River bank line adjacent to the project tract resulted in the identification of three magnetic anomalies that may represent cultural materials. None of these anomalies produced a sonographic signature. The locations of these anomalies are displayed in Figure 1. More detailed descriptions of these anomalies appear in Appendix A. One of these anomalies (Chowan A, located near the northwest corner of the project tract) generated a large magnetic signature and may represent the remains of a small vessel. This anomaly should be protected from construction activities until additional investigations determine the nature of the anomaly. The other two anomalies (Chowan B, located near the central portion of the project tract and Chowan C, located near the northwest corner of the project tract) appear to represent single ferrous items or small clusters of ferrous items. It is highly unlikely that Chowan B and Chowan C can generate information that can further the understanding of the use of Chowan River or riverine activities in the region. These anomalies are not eligible for the NRHP. Neither warrants additional management consideration.

Chapter IV. Summary and Management Recommendations

The cultural resource survey of the proposed NUCOR Steel Company plate mill tract in Hertford County, North Carolina, identified 31 terrestrial archaeological resources (12 sites and 18 isolated finds) and three underwater magnetic anomalies in or near the proposed mill tract (see Figure 1 and Table 1). The terrestrial sites (31HF11, 31HF26, and 31HF215-31HF224) and isolated finds (31HF225-31HF236 and 31HF238-31HF243**) contain primarily prehistoric artifacts; five sites produced historic artifacts. The underwater anomalies (Chowan A-C) appear to represent historic artifacts related to the use of the Chowan River; Chowan A may be a the remains of a small vessel. A brief summary of the interpretations of these resources follows. Management recommendations for all of these resources concludes Chapter IV.

Interpretations of Terrestrial Resources

Thirty terrestrial archaeological resources were identified on the project tract. Twenty-eight of these sites and isolated finds produced prehistoric artifacts. Temporally diagnostic artifacts from seven sites and two isolated finds permitted the identification of eight Early Woodland components, one Early-Middle Woodland component, five Middle Woodland components, and two Late Woodland components. The remaining 21 sites and isolated finds contain 18 unidentifiable Woodland components and one unidentifiable prehistoric component. Five sites and isolated finds produced historic artifacts; three of these isolated finds produced artifacts indicative of late nineteenth to early twentieth century occupations.

Prehistoric Use of the Project Tract

Paleoindian and Archaic Periods. No evidence of Paleoindian or Archaic use of the project tract was identified at any of the sites or isolated finds. However, some of the lithic debitage recovered from 18 sites and isolated finds may be associated with these periods. The apparent lack of evidence of Paleoindian use is not surprising. Artifacts associated with Paleoindian occupations generally occur as isolated tools; few concentrations of these artifacts have been identified. The apparent lack of Archaic occupation is more difficult to interpret. Archaic occupations generally are identified by the presence of diagnostic stone projectile points. Only one point, a Roanoke triangular point dating from the Early or Middle Woodland periods, was recovered during the present

investigations. The lack of these easily recognizable artifacts may reflect more recent use of the tract rather than abandonment or avoidance of the area during the Archaic periods. Binford (1957) notes that 31HF11 was known by local residents as an artifact producing locale. Undoubtedly, the site was often visited and collected during its use as farm land. Other sites in the project tract probably received similar visits. Given the degree of disturbance evidenced at all of the sites identified in the project tract, the opportunity for the exposure and collection of Archaic projectile points (as well as those from other periods) during the recent past is very high.

Early Woodland Period. The earliest evidence of the prehistoric use of the project tract are Deep Creek ceramics recovered from seven sites (31HF11, 31HF26, 31HF218, 31HF219, 31HF220, 31HF221, and 31HF223,) and one isolated find (31HF241). A Roanoke projectile point, recovered from isolated find 31HF231, also may reflect Early Woodland use of the project tract. The total number of Deep Creek ceramics and the large number of identifiable components suggest that the project tract was used intensively during the Early Woodland period.

Sites associated with the Early Woodland period include three large scatters of ceramic and lithic artifacts (31HF11, 31HF219, and 31HF223). One of these sites also produced small fragments of animal bone. These sites appear to represent residential base camps that were occupied for longer periods of time or by larger groups of people. Interestingly, these sites are roughly evenly spaced along the riverfront of the project tract (see Figures 1 and 3). The remaining five sites and isolated finds are small scatters of ceramics and lithics that probably represent resource procurement or processing locales associated with these larger sites. Undoubtedly, some of the 18 unidentifiable Woodland components represent Early Woodland procurement/processing locales.

As anticipated, the larger residential sites of the Early Woodland period are located immediately adjacent to the Chowan River. Smaller more activity-specific sites are scattered over the intervening spaces between the large sites and the uplands farther inland. Most of these smaller sites are located adjacent to small drainages or interior wetlands. These areas likely produced the kinds of resources collected nearby and processed at these locales.

Middle Woodland Period. Three sites (31HF11, 31HF219, and 31HF221) and one isolated find (31HF241) contain five Middle Woodland components. Four of these components are represented by Mt. Pleasant ceramics; one Hanover component is present at 31HF221. Isolated find 31HF231 contains a Roanoke projectile point that also may indicate a Middle Woodland component. As noted above, some of the 18 unidentifiable Woodland components may represent Middle

Woodland occupations or use as well. The number of Middle Woodland ceramics and components suggest that use of the project tract continued at a slightly reduced intensity compared to the preceding period.

Use of large residential locales on the Chowan River bluff continued at 31HF11 and 31HF219. The other locales producing Middle Woodland ceramics also produced Early Woodland ceramics. This suggests that settlement and subsistence strategies implemented during the Early Woodland period may have continued during the Middle Woodland period, although fewer people or groups may have been present.

Late Woodland Period. Only two sites produced evidence of Late Woodland occupations, 31HF11 and 31HF223. These components are represented by the presence of Cashie and Colington ceramics at these sites, respectively. Undoubtedly, some of the 18 unidentifiable Woodland components also are associated with Late Woodland occupation or use of the project tract.

The small numbers of Late Woodland ceramics and components suggest a shift in settlement or subsistence practices. During the latter centuries of the Late Woodland and early Historic periods, this may reflect the establishment of palisaded villages and concentrations of the remaining Native Americans in fewer and fewer settlements. It is interesting that the Late Woodland components are present in two of the large residential sites utilized during the Early and Middle Woodland periods. This suggests that these sites represent optimal locales for exploiting resources available in the project tract throughout the last 3,000 years.

Historic Period. Occupation or use of the project tract during the historic past appears to have been very ephemeral. Two sites (31HF11 and 31HF218) and three isolated finds (31HF228**, 31HF240**, and 31HF243**) produced evidence of historic occupations. Late nineteenth/early twentieth century ceramic or glass fragments were recovered from the three isolates. Brick fragments recovered from 31HF228** and 31HF243** suggest that structures may have been present at these locales. The reported location of a former house (31HF27**) failed to produce any artifacts during the present survey. The other historic artifacts may represent items lost during agricultural or timber harvesting/management activities in the project tract. Historic research failed to identify any large settlements or intensive use of the tract. This suggests that the project tract has been used predominantly as farm or timber lands throughout most of the last 300 years. This use continues to the present time.

Fisheries were present along the river by the 1860s, with at least one documented "fishery" present near the project tract. It is unclear what kinds of riverside facilities may have been present at this locale. The use of the Chowan River during the historic past is evidenced by the presence of the three magnetic anomalies (Chowan A-C) identified during the survey. This may reflect the use of the river bank as support facilities for intensive fishing operations.

Management Recommendations

Thirty-three cultural resources are present in and near NUCOR Steel Company's proposed plate mill tract in Herford County. These resources include 12 archaeological sites (31HF11, 31HF26, and 31HF215-31HF224), 18 isolated finds (31HF225-31HF236 and 31HF238-31HF243**), and three underwater magnetic anomalies (Chowan A-C). Eleven of the archaeological sites (31HF11, 31HF26, 31HF215-31HF222, and 31HF224), the 18 isolated finds, and two of the magnetic anomalies (Chowan B and Chowan C) contain no significant archaeological deposits or artifacts that can produce additional information concerning the prehistoric or historic use of the project tract or region. These resources are recommended not eligible for the NRHP. Further management consideration of these resources is not warranted. Land disturbing or dock construction activities associated with the development of NUCOR Steel Company's proposed plate mill should be allowed to proceed as planned without further consideration of these resources.

Archaeological site 31HF223 and magnetic anomaly Chowan A may contain archaeological deposits or materials that can produce information that will contribute to the interpretation of the Early Woodland, Late Woodland, or Historic riverine use of the project tract or region. These resources are recommended potentially eligible for the NRHP. Land disturbing or dock construction activities associated with the development of NUCOR Steel Company's proposed plate mill could negatively impact these resources.

Plant construction activities should avoid site 31HF223. If the site cannot be avoided, appropriate test investigations should be conducted. These investigations should include additional shovel testing to define the distributions of artifacts within the site in more detail, and the excavation of larger controlled test units to determine if buried intact cultural deposits or subsurface soil features are present. Once the NRHP eligibility of the site has been determined, definitive management actions can be developed.

Dock construction activities should avoid Chowan A. If this locale cannot be avoided, the targeted area should be examined in greater detail to determine the nature of this magnetic anomaly. Once the nature of Chowan A has been determined, a definitive NRHP assessment can be made and appropriate management actions can be developed.

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Appendix A.

An Archaeological Remote Sensing Survey of the Chowan River Along the Nucor Plate Mill Property Riverfront in Hertford County, North Carolina

An Archaeological Remote Sensing Survey of the Chowan River Along the NUCOR Plate Mill Property Riverfront in Hertford County, North Carolina

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5 September 1998

Abstract (language)

NUCOR Steel Company is proposing to construct a steel plate mill along the Chowan River in Hertford County, North Carolina. As part of the steel facility, an approximately 100-foot-long dock will be constructed into the Chowan River.

The Chowan River is an archaeologically sensitive area. For more than 300 years, the river has been actively navigated by various types of prehistoric and historic watercraft. Because of the potential for shipwrecks and other submerged cultural resources in the project area, McKim & Creed, Inc. (agent for NUCOR Steel) contracted Mid-Atlantic Technology and Environmental Research, Inc. (M-AT/ER) of Castle Hayne, North Carolina, to conduct a marine magnetometer and side scan sonar survey of the entire NUCOR Steel property riverfront. The remote sensing investigations were conducted in association with terrestrial investigations that were conducted by Brockington and Associates, Inc. of Mt. Pleasant, South Carolina. Remote sensing investigations were conducted on 19 August 1998.

M-AT/ER investigators conducted a controlled magnetometer and side scan sonar survey of a section of the Chowan River adjacent to the property location of the plate mill facility. During analysis of magnetic and sonar data, three (3) magnetic anomalies, which were not associated with modern shoreline debris, fishing gear, out-falls or docks, were identified. Only one of the anomalies has the potential to be associated with a significant submerged cultural resource. M-AT/ER recommends avoidance of impacts to the single magnetic anomaly. If avoidance is not possible, additional underwater archaeological investigations to identify and assess the remote sensing targets are recommended.

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An Archaeological Remote Sensing Survey of the Chowan River Along the NUCOR Plate Mill Property Riverfront in Hertford County, North Carolina

Project Location

The NUCOR Plate Mill property is located on the Chowan River in Hertford County, North Carolina. The underwater archaeological investigations included a survey of an area approximately 7,700 feet long by 250 feet wide. The project area began at the southern shoreline of the Chowan River and extended out more than 250 feet, being situated between Eure Landing and Pettys Shore (Figure A-1).

Previous Archaeological Investigations in the Project Vicinity

No previous underwater archaeological investigations have been conducted in the project area vicinity, nor have any submerged archaeological sites been recorded in the project area.

Description Of Work

Field Investigations

M-AT/ER's investigators conducted the magnetometer and side scan sonar surveys from a 25-foot vessel, using a Geometrics 881 cesium magnetometer and a Marine Sonics 600 kHz side scan sonar. The magnetometer was operated using MAGSEA™ data acquisition software. Magnetic data was collected and recorded at 1-second sample intervals (or approximately every 7 feet along a track line while traveling at 4 knots) at a depth of approximately 20 feet above the bottom surface. The marine magnetometer sensor was towed astern of the port side and directly aft of the GPS antenna. Lay-back of the magnetometer sensor was 50 feet (from the GPS antenna). In water depths exceeding 25 feet, additional weight was added to the magnetometer sensor cable to maintain a consistent sensor height above the bottom. The side scan sonar was operated on a 50-meter scale setting, recording a width of 100 meters of bottom surface per transect. The side scan sensor was towed at a depth of approximately 5 to 20 feet below the water surface, depending on water depth. The sonogram record was monitored constantly to develop the most detailed bottom image possible.

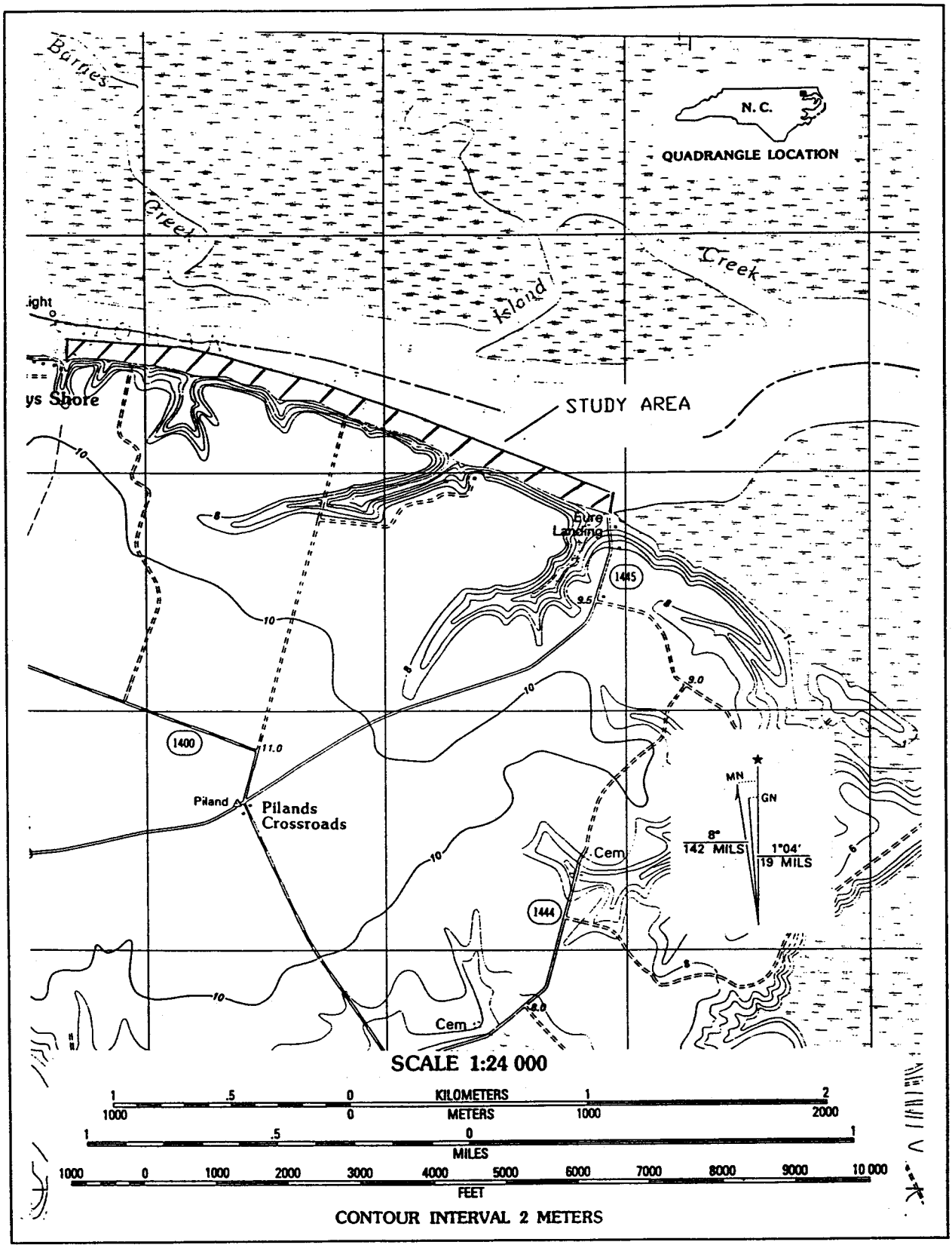

Figure A-1. Remote sensing project location map.

The remote sensing survey was conducted with the aid of an onboard computer navigation system interfaced with a Differential Global Positioning System (DGPS). The DGPS consisted of a NavStar™ receiver system operating with a Coast Guard differential radio link. A GPS receiver and radio link also were located aboard the survey vessel and interfaced with a PC computer system. HYPACK™ hydrographic survey software was used to generate parallel survey lines spaced 25 feet apart. It also provided and maintained constant positioning data. The side scan sonar was utilized only on two survey lines, one approximately 50 feet from the shoreline and one approximately 150 feet offshore.

Data Analysis And Assessment

Magnetic anomalies were identified on survey data records as they were generated. The local environment also was noted on data-log-sheets. The local environment included man-made features such as docks, wharves, pipelines, power lines, buoys, channel markers, and/or other conditions or objects that could influence magnetic or acoustic data. At the completion of the general survey, a field analysis of magnetic data was performed. Targets that were detected along only one or two survey lines were relocated and resurveyed using a line spacing of 15 feet. After field investigations were completed, analysis included contour plotting of magnetic data to graphically show the relationship among anomalies and to help interpret relative anomaly intensity. This data was compared to sonar records to determine any correlation between magnetic and acoustic signatures.

Magnetic anomalies were categorized by intensity, duration, and extent (i.e., amplitude), as well as signature characteristics. Acoustic target signatures were characterized by their nature and extent. Features of the acoustic target signatures were described by their length, width, shape, and height above the bottom surface.

The assessment of target signatures was based primarily on the nature and characteristics of the sonar and/or magnetic signatures. Exposed shipwrecks, large or small, often have distinctive sonogram signatures. Often sonar signatures will have associated magnetic signatures. If the sonar signature demonstrates geometric forms or intersecting lines with some relief above the bottom surface and has a magnetic signature of any sort, it can be categorized as a potentially significant target signature. Often, modern debris near docks or bridges is easily identified based solely on the sonar signature's characteristic. However, it is more common to find material partially exposed. These objects frequently produce a record that is obviously manmade but impossible to identify or

date. In making an archaeological assessment of any sonar target, the history and modern use of the waterway must be taken into consideration. Because of the Chowan River's rich maritime history, assessment of each target's potential to be associated with a significant cultural resource (based on standard criteria for nomination to the National Register of Historic Places) was made on the conservative side.

Magnetic target signatures alone are more difficult to assess. Without any supporting sonar record, the nature of the bottom sediments and the water currents become more important to the assessment process. Small, single-source magnetic signatures have the least potential to be a significant cultural resource. Although they might represent cannon balls or historic anchors, these types of signatures have little potential to meet National Register criteria.

More complex magnetic anomalies, represented by broad monopolar and dipolar types of signatures, have greater potential based on bottom type. Soft migrating sand or mud can bury large wrecks, leaving little or no indication of their presence on the bottom surface.

A historic shipwreck may produce an infinite number of magnetic anomaly signatures. This is because there are an infinite number of variables that can influence or create localized changes in the earth's magnetic field. Some of these variables include location, position of a ferrous object within the site(s), the position of dissimilar metals, oxidation of metals, the vessel's construction and cargo, sea state, etc. In making an assessment of a magnetic anomaly's potential to represent a significant cultural resource, underwater archaeologists are forced to be circumspect in their predictions.

All of the above factors are taken into account when making recommendations as to a remote sensing target's potential to be associated with a significant culture resource. Successful interpretation of marine remote sensing data is very dependent on the experience of the investigator.

Description Of Findings

Historical Research

No historic shipwrecks have been recorded in the Chowan River near the proposed project area. Historical research conducted by Brockington and Associates, Inc. suggests that the area has

had a long history of herring fishing activity. A 1863 map created during the Civil War indicates that several fishing camps or processing camps were situated along the banks of the Chowan River. One such camp called "Askew's Fish'y" was located along NUCOR Steel properties' shoreline. However, no indications (such as pilings or submerged debris) of the fishing facility were identified during the remote sensing survey. Net fishing in the vicinity continues today. Numerous lines of net stakes were observed in the shallow "flats" along the eastern portion of the project area. Water depths along the western portion of the survey area are too deep near shore to place stationary nets.

Remote Sensing Survey

The marine magnetometer survey recorded a natural magnetic background that ranged between 52360 and 52480 gammas within the project area. A broad geologically-induced monopolar magnetic anomaly was apparent over 250 feet offshore and near the central portion of the survey area. The rather localized signature associated with the anomaly suggests that some type of intrusive geological feature is present at that location. Because of survey limits, it is unclear if the anomaly/geological feature continued across the river or was isolated to that location.

Side scan sonar records suggest that the river bottom along the NUCOR property is composed of silty sand or mud. The majority of the sediments appear to be eroding from the shoreline. There was no near-shore evidence (such as sand waves) of migrating sediments.

Analysis of all magnetic and sonar data resulted in the identification of three (3) targets. All of the targets were magnetic anomalies. None of the anomalies had an associated sonogram signature.

Target Chowan-A:	Latitude = N 36.36205176	Longitude = W 076.81313889	
	NC State Plane Coordinates	E = 2643922	N = 957798
	UTM Coordinates (NAD 1927)	E = 337298	N = 4025421

Target Chowan-A had a dipolar magnetic signature of 70 gammas maximum intensity (Figures A-2 and A-3). The object or material creating the magnetic anomaly influenced an area over 6 one-second-sample intervals. The nature and duration of the magnetic signature suggests that the material or object producing the magnetic anomaly has a relatively high ferrous mass compared to its size. No sonogram signature was associated with the magnetic anomaly. Although the intensity

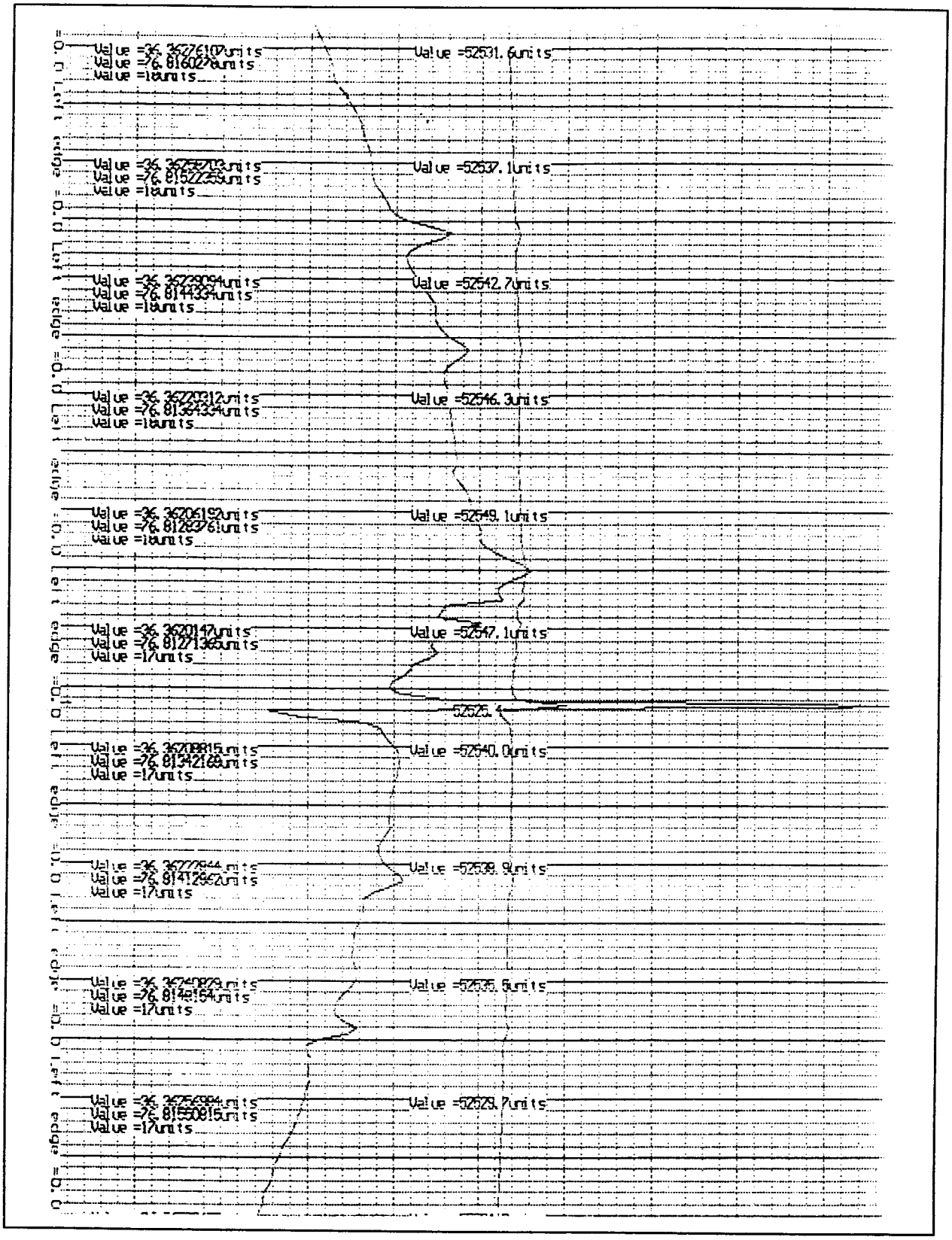

Figure A-3. Magnetic signature Target A.

and duration of the anomaly is relativity low, the anomaly has the potential to be associated with a historic fishing vessel or other small boat. Avoidance of impact to the target location is recommended. If avoidance is not an option, additional underwater archaeological investigations, to identify the nature of the material producing the magnetic signature are recommended prior to direct construction impacts.

Target Chowan-B:	Latitude = N 36.36084246	Longitude = W 079.92592864	
	NC State Plane Coordinates	E = 2329331	N = 416191
	UTM Coordinates (NAD 1927)	E = 337841	N = 4025277

Target Chowan-B had a dipolar magnetic signature of 16 gammas maximum intensity (Figures A-2 and A-4). The object or material creating the magnetic anomaly influenced an area over 7 one-second-sample intervals. The nature and duration of the magnetic signature suggests that the material or object producing the magnetic anomaly has a relatively low ferrous mass. No sonogram signature was identified in association with the magnetic anomaly. The low intensity magnetic signature is unlikely to be associated with a significant submerged cultural resource. No additional investigations or mitigation is recommended.

Target Chowan-C:	Latitude = N 32.9689000	Longitude = W 079.92675000	
	NC State Plane Coordinates	E = 2333173	N = 416341
	UTM Coordinates (NAD 1927)	E = 337112	N = 4025467

Target Chowan-C had a dipolar magnetic signature of 15 gammas maximum intensity (Figures A-2 and A-5). The object or material creating the magnetic anomaly influenced an area over 5 one-second-sample intervals. The nature and duration of the magnetic signature suggests that the material or object producing the magnetic anomaly has a relatively low ferrous mass. No sonogram signature was identified in association with the magnetic anomaly. The low intensity magnetic signature is unlikely to be associated with a significant submerged cultural resource. No additional investigations or mitigation is recommended.

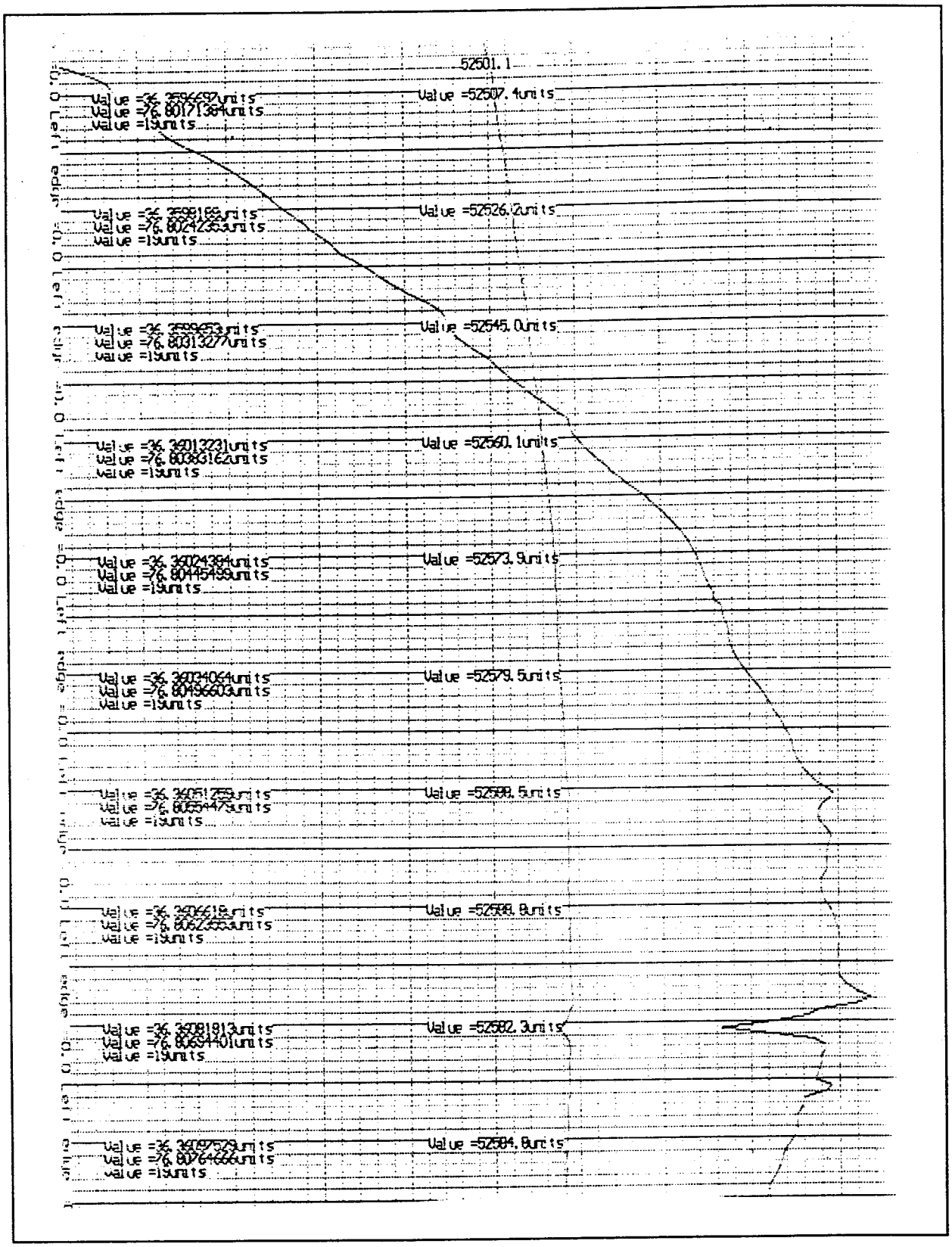

Figure A-4. Magnetic signature Target B.

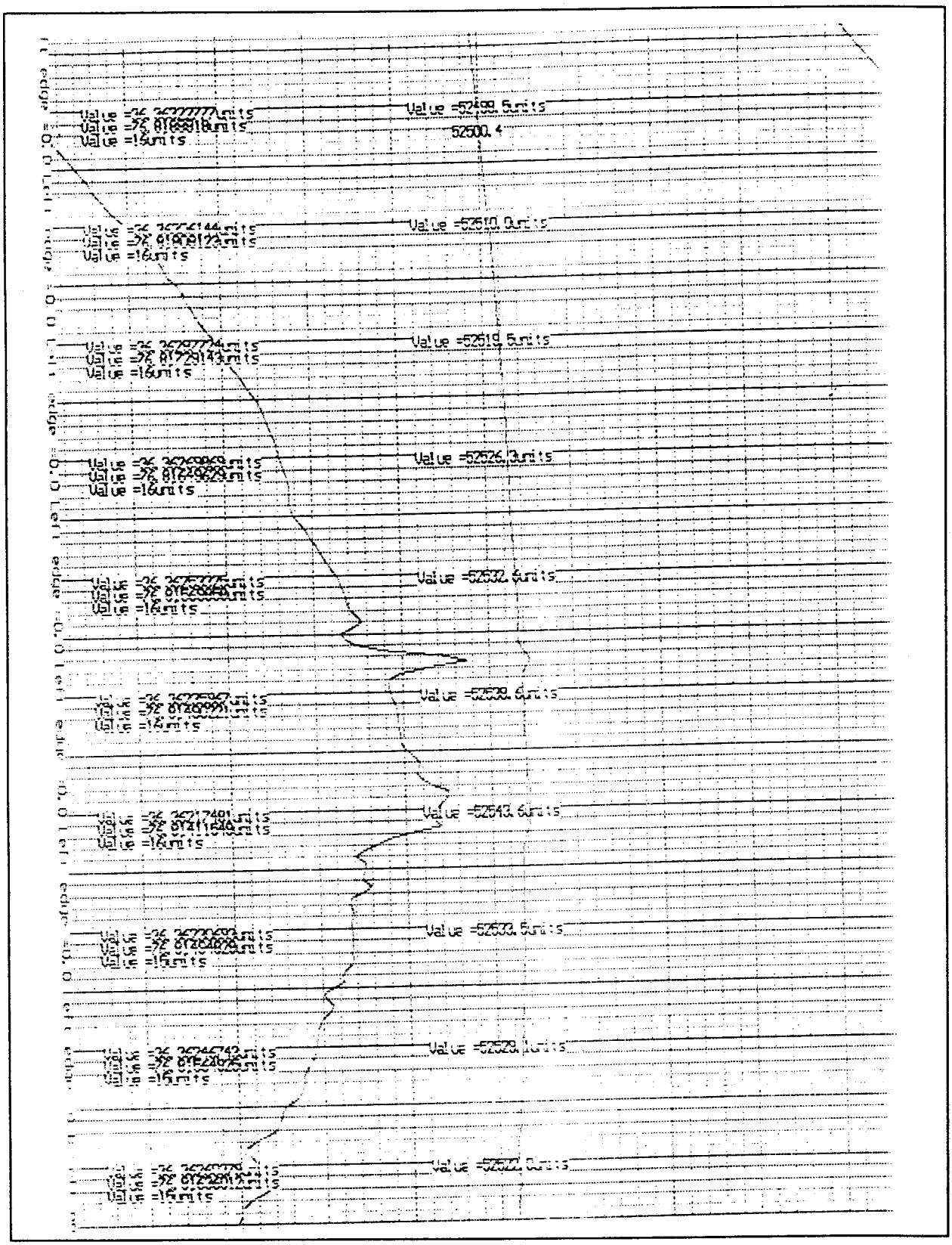

Figure A-5. Magnetic signature Target C.

Conclusions And Recommendations

Although the section of the Chowan River at the NUCOR property site has been an active herring fishing ground for well over 150 years, no evidence of historic fishing activity was identified by the remote sensing survey.

Three (3) magnetic anomalies were identified within the project area. Only one has the potential to be associated with a small historic craft. A minimum 200-foot-radius no-impact buffer zone is recommended around Target Chowan-A. If avoidance is not possible, additional underwater investigations to identify and assess the target are recommended prior to impacts caused by construction activities. Targets Chowan-B and Chowan-C have a low potential to be associated with a significant cultural resource. No additional investigations or mitigation is recommended for these targets.

Appendix B.

Artifact Inventories

Brockington and Associates, Inc. uses the following proveniencing system.

Prov. 1 designates General Surface Collection. Numbers after the decimal designate subsequent collections.

Prov. 2 to 200 designate shovel tests. Prov. 2.0 designates surface at a shovel test site. Prov. 2.1 designates level 1 of a shovel test. Prov. 2.2 etc... designates other levels of a shovel test. Controlled surface collections and 50 x 50 cm units are also designated by these numbers.

Prov. 201 to 400 designate 1 x 1 m units done for testing purposes. Numbers after the decimal designate levels.

Prov. 401 to 600 designate 2 x 2 m units done for data recovery. Numbers after the decimal designate levels. Also flotation is designated by 01 added after the last number. For example unit 401.4 is unit 401, level 4. 401.401 designates the flotation from unit 401, level 4.

Prov. 601 and over designate features. Numbers after the decimal designate levels or components of the feature such as halves.

The first column gives the provenience:catalog number. The second column gives the count. The third column gives the weight in grams, when applicable. Residual sherds are prehistoric ceramic sherds that are less than one inch in diameter and surface treatment cannot be precisely identified.

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SITE NUMBER : 31HF11

Provenience # 1.0		Description : General Surface Collection
1.0:1	1	tin button
1.0:2	1	metavolcanic tertiary core reduction flake
1.0:3	1	translucent quartz cobble core
1.0:4	3	translucent quartz flake fragment
1.0:5	1	rose quartz small linear tertiary reduction flake

Provenience # 2.1		Description : Transect 1, Shovel Test 1
2.1:1	1	residual sherd

Provenience # 3.1		Description : Transect 1, Shovel Test 2
3.1:1	1	fabric impressed body sherd, coarse sand temper: Deep Creek
3.1:2	1	eroded body sherd, coarse sand temper
3.1:3	2	residual sherd
3.1:4	3	cobble: translucent quartz

Provenience # 4.1		Description : Transect 1, Shovel Test 2 + 15m North
4.1:1	1	translucent quartz small linear secondary cobble reduction flake
4.1:2	2	translucent quartz flake fragment
4.1:3	1	residual sherd

Provenience # 5.1		Description : Transect 1, Shovel Test 3
5.1:1	1	quartzite shatter
5.1:2	1	eroded body sherd, fine/medium sand temper

Provenience # 6.1		Description : Transect 1, Shovel Test 3 + 15m North
6.1:1	1	residual sherd

Provenience # 7.1		Description : Transect 1, Shovel Test 6
7.1:1	1	cord marked body sherd, very coarse sand temper: Deep Creek

Provenience # 8.1		Description : Transect 1, Shovel Test 6 + 15m North
8.1:1	2	translucent quartz shatter
8.1:2	1	metavolcanic flake fragment
8.1:3	1	residual sherd

Provenience # 9.1		Description : Transect 1, Shovel Test 8
9.1:1	1	translucent quartz shatter
9.1:2	1	net impressed body sherd, coarse sand temper: Deep Creek

Provenience # 10.1		Description : Transect 1, Shovel Test 8 + 15m North
10.1:1	1	translucent quartz small transverse secondary cobble reduction flake
10.1:2	1	metavolcanic flake fragment
10.1:3	2	residual sherd

Provenience # 11.1		Description : Transect 1, Shovel Test 9
11.1:1	2	simple stamped body sherd, granular temper: Cashie
11.1:2	1	cord marked rim sherd, very coarse sand temper: Deep Creek

Provenience # 12.1		Description : Transect 1, Shovel Test 9 + 15m North
12.1:1	1	simple stamped body sherd, very coarse sand temper: Cashie
12.1:2	1	fabric impressed body sherd, coarse sand temper: Deep Creek
12.1:3	1	eroded body sherd, fine/medium sand temper
12.1:4	4	residual sherd

Provenience # 13.1		Description : Transect 2, Shovel Test 1
13.1:1	1	residual sherd

Provenience # 14.1		Description : Transect 2, Shovel Test 3
14.1:1	2	residual sherd
14.1:2	1	metavolcanic thinning flake

Provenience # 15.1		Description : Transect 2, Shovel Test 7
15.1:1	1	residual sherd

Provenience # 16.1		Description : Transect 2, Shovel Test 8
16.1:1	1	simple stamped body sherd, granular temper: Cashie
16.1:2	3	residual sherd

Provenience # 17.1		Description : Transect 2, Shovel Test 8 + 15m East
17.1:1	1	eroded rim sherd, granular temper
17.1:2	2	residual sherd

31HF11 continued

Provenience # 18.1		Description : Transect 2, Shovel Test 9
18.1:1	3	residual sherd
18.1:2	1	quartzite shatter

Provenience # 19.1		Description : Transect 3, Shovel Test 2
19.1:1	1	eroded body sherd, fine/medium sand temper

Provenience # 20.1		Description : Transect 3, Shovel Test 2 + 15m East
20.1:1	1	simple stamped body sherd, granular temper: Cashie
20.1:2	1	quartzite flake fragment

Provenience # 21.1		Description : Transect 3, Shovel Test 2 + 15m South
21.1:1	1	fabric impressed body sherd, granular temper: Mount Pleasant
21.1:2	1	residual sherd

Provenience # 22.1		Description : Transect 3, Shovel Test 3
22.1:1	5	residual sherd
22.1:2	1	metavolcanic flake fragment
22.1:3	4	metavolcanic shatter
22.1:4	1	translucent quartz flake fragment
22.1:5	1	quartzite shatter

Provenience # 23.1		Description : Transect 3, Shovel Test 4
23.1:1	1	residual sherd

Provenience # 24.1		Description : Transect 3, Shovel Test 5
24.1:1	1	residual sherd
24.1:2	1	metavolcanic thinning flake

Provenience # 25.1		Description : Transect 3, Shovel Test 7
25.1:1	1	residual sherd
25.1:2	1	metavolcanic shatter
25.1:3	1	quartzite flake fragment
25.1:4	1	quartzite primary flake

Provenience # 26.1		Description : Transect 3, Shovel Test 8
26.1:1	1	residual sherd
26.1:2	1	quartzite flake fragment

Provenience # 27.1		Description : Transect 4, Shovel Test 3
27.1:1	2	translucent quartz flake fragment

Provenience # 28.1		Description : Transect 4, Shovel Test 4
28.1:1	1	cobble: quartzite

Provenience # 29.1		Description : Transect 4, Shovel Test 5
29.1:1	1	residual sherd

Provenience # 30.1		Description : Transect 6, Shovel Test 7
30.1:1	1	residual sherd

Provenience # 31.1		Description : Transect 6, Shovel Test 7 + 15m North
31.1:1	1	rose quartz small linear tertiary reduction flake

Provenience # 32.1		Description : Transect 6, Shovel Test 7 + 45m North
32.1:1	2	residual sherd

Provenience # 33.1		Description : Transect 6, Shovel Test 8 + 15m South
33.1:1	1	residual sherd

SITE NUMBER : 31HF26

Provenience # 2.1		Description : Transect 168, Shovel Test 2
2.1:1	1	cord marked body sherd, granular temper: Deep Creek
2.1:2	2	eroded body sherd, coarse sand temper
2.1:3	1	residual sherd
2.1:4	1	orthoquartzite flake fragment

Provenience # 3.1		Description : Transect 168, Shovel Test 2 + 15m at 135 degrees
3.1:1	1	translucent quartz flake fragment
3.1:2	2	orthoquartzite flake fragment

SITE NUMBER : 31HF215

Provenience # 2.1		Description : Transect 5, Shovel Test 6
2.1:1	1	crystal quartz flake fragment

Provenience # 3.1		Description : Transect 5, Shovel Test 6 + 15m West
3.1:1	1	residual sherd
3.1:2	1	ceramic pipe stem: fine sand temper
3.1:3	1	quartzite shatter

31HF215 continued

Provenience # 4.1		Description : Transect 6, Shovel Test 3
4.1:1	1	quartzite small linear tertiary reduction flake

SITE NUMBER : 31HF216

Provenience # 2.1		Description : Transect 8, Shovel Test 3 + 15m East
2.1:1	1	eroded body sherd, granular temper
2.1:2	1	residual sherd

Provenience # 3.1		Description : Transect 8, Shovel Test 3 + 15m South
3.1:1	1	plain body sherd, granular temper
3.1:2	1	translucent quartz flake fragment

Provenience # 4.1		Description : Transect 8, Shovel Test 3 + 15m West
4.1:1	4	residual sherd
4.1:2	1	quartzite flake fragment
4.1:3	1	translucent quartz flake fragment

SITE NUMBER : 31HF217

Provenience # 2.1		Description : Transect 8, Shovel Test 5
2.1:1	1	residual sherd

Provenience # 3.1		Description : Transect 8, Shovel Test 5 + 15m North
3.1:1	1	eroded body sherd, fine/medium sand temper
3.1:2	1	residual sherd

Provenience # 4.1		Description : Transect 8, Shovel Test 5 + 15m South
4.1:1	3	residual sherd

Provenience # 5.1		Description : Transect 8, Shovel Test 5 + 15m West
5.1:1	1	residual sherd

SITE NUMBER : 31HF218

Provenience # 2.1		Description : Transect 12, Shovel Test 9
2.1:1	1	residual sherd

Provenience # 3.1		Description : Transect 13, Shovel Test 1 + 15m at 280 degrees
3.1:1	1	eroded body sherd, fine/medium sand temper
3.1:2	1	residual sherd
3.1:3	1	quartzite small linear tertiary reduction flake

Provenience # 4.1		Description : Transect 13, Shovel Test 3
4.1:1	1	residual sherd
4.1:2	1	metavolcanic flake fragment

Provenience # 5.1		Description : Transect 14, Shovel Test 9
5.1:1	1	unidentifiable nail

Provenience # 6.1		Description : Transect 14, Shovel Test 9 + 15m East
6.1:1	2	fabric impressed body sherd, very coarse sand temper: Deep Creek, mend
6.1:2	0.1	faunal remains

SITE NUMBER : 31HF219

Provenience # 2.1		Description : Transect 31, Shovel Test 1
2.1:1	3	residual sherd

Provenience # 3.1		Description : Transect 31, Shovel Test 1 + 15m at 40 degrees
3.1:1	1	plain body sherd, very coarse sand temper
3.1:2	1	residual sherd

Provenience # 4.1		Description : Transect 31, Shovel Test 2
4.1:1	1	fabric impressed rim sherd, very coarse sand temper: Deep Creek
4.1:2	1	fabric impressed body sherd, very coarse sand temper: Deep Creek
4.1:3	2	eroded body sherd, granular temper
4.1:4	6	residual sherd

Provenience # 5.1		Description : Transect 31, Shovel Test 2 + 15m South
5.1:1	2	residual sherd

Provenience # 6.1		Description : Transect 31, Shovel Test 2 + 15m West
6.1:1	1	eroded body sherd, coarse sand temper
6.1:2	1	translucent quartz shatter

31HF219 continued

Provenience # 7.1		Description : Transect 31, Shovel Test 3
7.1:1	1	residual sherd

Provenience # 8.1		Description : Transect 32, Shovel Test 15
8.1:1	1	residual sherd
8.1:2	1	translucent quartz shatter
8.1:3	1	cobble: translucent quartz

Provenience # 9.1		Description : Transect 32, Shovel Test 15 + 15m at 30 degrees
9.1:1	1	residual sherd
9.1:2	1	quartzite shatter

Provenience # 10.1		Description : Transect 32, Shovel Test 15 + 15m West
10.1:1	2	residual sherd

Provenience # 11.1		Description : Transect 32, Shovel Test 15 + 15m South + 15m West
11.1:1	1	residual sherd

Provenience # 12.1		Description : Transect 32, Shovel Test 16
12.1:1	1	residual sherd

Provenience # 13.1		Description : Transect 32, Shovel Test 17
13.1:1	1	fabric impressed body sherd, very coarse sand temper: Deep Creek

Provenience # 14.1		Description : Transect 32, Shovel Test 13
14.1:1	2	residual sherd

Provenience # 15.1		Description : Transect 33, Shovel Test 1
15.1:1	4	residual sherd
15.1:2	1	translucent quartz shatter

Provenience # 16.1		Description : Transect 33, Shovel Test 1 + 15m at 40 degrees
16.1:1	1	eroded rim sherd, very coarse sand temper
16.1:2	7	residual sherd
16.1:3	3	translucent quartz flake fragment
16.1:4	1	quartzite flake fragment
16.1:5	1	cobble: quartzite
16.1:6	1	metavolcanic thinning flake

Provenience # 17.1		Description : Transect 33, Shovel Test 1 + 15m at 130 degrees
17.1:1	1	eroded body sherd, very coarse sand temper
17.1:2	1	residual sherd

Provenience # 18.1		Description : Transect 33, Shovel Test 3
18.1:1	2	residual sherd

Provenience # 19.1		Description : Transect 33, Shovel Test 4
19.1:1	1	orthoquartzite cobble core

Provenience # 20.1		Description : Transect 33, Shovel Test 4 + 15m South
20.1:1	1	fabric impressed rim sherd, granular temper: Mount Pleasant

Provenience # 21.1		Description : Transect 33, Shovel Test 5
21.1:1	1	residual sherd
21.1:2	1	quartzite primary flake

Provenience # 22.1		Description : Transect 33, Shovel Test 5 + 15m East
22.1:1	1	residual sherd

Provenience # 23.1		Description : Transect 33, Shovel Test 5 + 15m at 220 degrees
23.1:1	1	eroded rim sherd, fine/medium sand temper
23.1:2	1	translucent quartz flake fragment

Provenience # 24.1		Description : Datum Shovel Test
24.1:1	2	cobble: orthoquartzite

Provenience # 25.1		Description : Datum + 15m North
25.1:1	1	eroded rim sherd, coarse sand temper
25.1:2	3	residual sherd

Provenience # 26.1		Description : Datum + 15m West
26.1:1	2	residual sherd

Provenience # 27.1		Description : Datum + 15m South + 15m West
27.1:1	1	plain body sherd, coarse sand temper

31HF219 continued

Provenience # 28.1 West		Description : Datum + 15m South + 30m
28.1:1	5	residual sherd
28.1:2	1	orthoquartzite small circular tertiary reduction flake

Provenience # 29.1		Description : Datum + 45m South
29.1:1	1	residual sherd

Provenience # 30.1 West		Description : Datum + 15m North + 15m
30.1:1	2	residual sherd

Provenience # 31.1 West		Description : Datum + 30m North + 15m
31.1:1	1	eroded rim sherd, coarse sand temper
31.1:2	3	residual sherd

Provenience # 32.1 West		Description : Datum + 30m South + 15m
32.1:1	2	residual sherd
32.1:2	1	translucent quartz small circular tertiary reduction flake

Provenience # 33.1 West		Description : Datum + 30m North + 30m
33.1:1	1	residual sherd

Provenience # 34.1 West		Description : Datum + 30m South + 30m
34.1:1	1	fabric impressed body sherd, fine/medium sand temper: Deep Creek
34.1:2	1	residual sherd

Provenience # 35.1 West		Description : Datum + 45m South + 15m
35.1:1	1	residual sherd
35.1:2	1	cobble: translucent quartz

Provenience # 36.1 East		Description : Datum + 45m South + 30m
36.1:1	2	residual sherd
36.1:2	1	cobble: translucent quartz
36.1:3	1	quartzite shatter

Provenience # 37.1 East		Description : Datum + 45m South + 45m
37.1:1	1	fabric impressed body sherd, very coarse sand temper: Deep Creek
37.1:2	2	residual sherd

Provenience # 38.1 East		Description : Datum + 45m South + 60m
38.1:1	1	translucent quartz large transverse tertiary reduction flake

Provenience # 39.1 East		Description : Datum + 60m South + 60m
39.1:1	2	residual sherd

Provenience # 40.1		Description : Datum + 75m South
40.1:1	3	residual sherd

Provenience # 41.1 West		Description : Datum + 75m South + 30m
41.1:1	1	orthoquartzite shatter
41.1:2	2	residual sherd

Provenience # 42.1 West		Description : Datum + 90m South + 30m
42.1:1	3	residual sherd

Provenience # 43.1		Description : Transect 33, Shovel Test 14
43.1:1	1	residual sherd

SITE NUMBER : 31HF220

Provenience # 2.1		Description : Transect 44, Shovel Test 13
2.1:1	1	fabric impressed body sherd, very coarse sand temper: Deep Creek
2.1:2	1	residual sherd
2.1:3	1	metavolcanic tertiary bifacial reduction flake
2.1:4	1	chert thinning flake: black chert, type unknown

Provenience # 3.1 15m at 40 degrees		Description : Transect 45, Shovel Test 1 +
3.1:1	1	eroded rim sherd, coarse sand temper
3.1:2	1	eroded body sherd, coarse sand temper
3.1:3	1	metavolcanic thinning flake
3.1:4	1	translucent quartz small linear tertiary reduction flake

31HF220 continued

Provenience # 4.1		Description : Transect 45, Shovel Test 2
4.1:1	1	residual sherd

SITE NUMBER : 31HF221

Provenience # 2.1		Description : Transect 68, Shovel Test 9
2.1:1	1	cord marked body sherd, coarse sand temper: Deep Creek
2.1:2	2	residual sherd
2.1:3	1	orthoquartzite primary flake
2.1:4	1	orthoquartzite shatter
2.1:5	1	translucent quartz small linear tertiary reduction flake

Provenience # 3.1		Description : Transect 70, Shovel Test 9
3.1:1	1	cord marked body sherd, very coarse sand temper: Mount Pleasant
3.1:2	2	fabric impressed body sherd, granular temper: Mount Pleasant, mend
3.1:3	1	residual sherd

Provenience # 4.1		Description : Transect 70, Shovel Test 10
4.1:1	1	residual sherd

Provenience # 5.1		Description : Transect 70, Shovel Test 10 + 15m East
5.1:1	1	residual sherd

Provenience # 6.1		Description : Transect 70, Shovel Test 11
6.1:1	2	residual sherd
6.1:2	1	orthoquartzite shatter

Provenience # 7.1		Description : Transect 70, Shovel Test 12
7.1:1	1	cord marked body sherd, grog temper: Hanover
7.1:2	1	residual sherd
7.1:3	2	orthoquartzite small transverse secondary cobble reduction flake
7.1:4	1	orthoquartzite flake fragment
7.1:5	2	quartzite flake fragment
7.1:6	3	translucent quartz flake fragment

Provenience # 8.1		Description : Transect 70, Shovel Test 13
8.1:1	1	eroded body sherd, fine/medium sand temper
8.1:2	7	residual sherd
8.1:3	1	translucent quartz flake fragment
8.1:4	9	orthoquartzite flake fragment
8.1:5	1	metavolcanic flake fragment
8.1:6	1	translucent quartz shatter

Provenience # 9.1		Description : Transect 71, Shovel Test 1
9.1:1	4	residual sherd

Provenience # 10.1		Description : Transect 71, Shovel Test 2
10.1:1	8	residual sherd
10.1:2	1	translucent quartz flake fragment

Provenience # 11.1		Description : Transect 71, Shovel Test 3
11.1:1	6	residual sherd

Provenience # 12.1		Description : Transect 72, Shovel Test 8
12.1:1	1	residual sherd

Provenience # 13.1		Description : Transect 72, Shovel Test 10
13.1:1	1	residual sherd

Provenience # 14.1		Description : Transect 72, Shovel Test 11
14.1:1	4	residual sherd

Provenience # 15.1		Description : Transect 72, Shovel Test 8 + 15m at 25 degrees
15.1:1	1	residual sherd

SITE NUMBER : 31HF222

Provenience # 2.1		Description : Transect 68, Shovel Test 1
2.1:1	1	eroded body sherd, granular temper

Provenience # 3.1		Description : Transect 68, Shovel Test 2
3.1:1	1	eroded body sherd, very coarse sand temper
3.1:2	2	residual sherd

Provenience # 4.1		Description : Transect 68, Shovel Test 2 + 15m West
4.1:1	2	residual sherd
4.1:2	1	quartzite flake fragment

Provenience # 5.1		Description : Transect 68, Shovel Test 3
5.1:1	2	residual sherd

31HF222 continued

Provenience # 6.1		Description : Transect 68, Shovel Test 3 + 15m East
6.1:1	2	residual sherd

SITE NUMBER : 31HF223

Provenience # 2.1		Description : Transect 171, Shovel Test 2
2.1:1	3	residual sherd

Provenience # 3.1		Description : Transect 172, Shovel Test 12
3.1:1	1	residual sherd
3.1:2	1	translucent quartz flake fragment

Provenience # 4.1		Description : Transect 172, Shovel Test 14
4.1:1	1	residual sherd

Provenience # 5.1		Description : Transect 173, Shovel Test 4
5.1:1	2	residual sherd

Provenience # 6.1		Description : Transect 173, Shovel Test 4 + 15m South
6.1:1	1	fabric impressed body sherd, granular temper: Deep Creek
6.1:2	1	orthoquartzite flake fragment

Provenience # 7.1		Description : Transect 175, Shovel Test 4
7.1:1	5	residual sherd
7.1:2	1	translucent quartz flake fragment
7.1:3	1	cobble: quartzite
7.1:4	1	orthoquartzite flake fragment

Provenience # 8.1		Description : Transect 174, Shovel Test 7
8.1:1	1	eroded rim sherd, fine/medium sand temper
8.1:2	1	residual sherd
8.1:3	1	orthoquartzite flake fragment

Provenience # 9.1		Description : Transect 174, Shovel Test 8
9.1:1	3	residual sherd

Provenience # 10.1		Description : Transect 174, Shovel Test 10
10.1:1	1	fabric impressed body sherd, coarse sand temper: Deep Creek
10.1:2	1	fabric impressed body sherd, granular temper: Deep Creek
10.1:3	1	eroded rim sherd, very coarse sand temper

Provenience # 11.1		Description : Transect 174, Shovel Test 11
11.1:1	1	residual sherd

Provenience # 12.1		Description : Transect 174, Shovel Test 13
12.1:1	1	metavolcanic shatter

Provenience # 13.1		Description : Transect 175, Shovel Test 3
13.1:1	3	residual sherd
13.1:2	1	metavolcanic weathered flake
13.1:3	1	metavolcanic shatter
13.1:4	3	translucent quartz flake fragment
13.1:5	1	translucent quartz small circular tertiary reduction flake
13.1:6	0.5	faunal remains

Provenience # 14.1		Description : Transect 175, Shovel Test 5
14.1:1	2	eroded body sherd, fine/medium sand temper
14.1:2	6	residual sherd
14.1:3	1	translucent quartz large linear tertiary reduction flake

Provenience # 15.1		Description : Transect 175, Shovel Test 6
15.1:1	6	residual sherd
15.1:2	2	metavolcanic flake fragment

Provenience # 16.1		Description : Transect 175, Shovel Test 7
16.1:1	1	cobble: translucent quartz
16.1:2	1	quartzite flake fragment

Provenience # 17.1		Description : Transect 175, Shovel Test 8
17.1:1	1	translucent quartz shatter

Provenience # 18.1		Description : Transect 176, Shovel Test 3
18.1:1	1	plain body sherd, granular temper

31HF223 continued

Provenience # 19.1			Description : Transect 176, Shovel Test 4
19.1:1	6		residual sherd

Provenience # 20.1			Description : Transect 176, Shovel Test 5
20.1:1	1		fabric impressed body sherd, shell temper: Colington
20.1:2	2		residual sherd

Provenience # 21.1			Description : Transect 176, Shovel Test 6
21.1:1	2		residual sherd
21.1:2	2		translucent quartz flake fragment

Provenience # 22.1			Description : Transect 176, Shovel Test 7
22.1:1	1		fabric impressed body sherd, shell temper: Colington
22.1:2	1		residual sherd

Provenience # 23.1			Description : Transect 177, Shovel Test 2
23.1:1	1		fabric impressed rim sherd, fine/medium sand temper: Deep Creek
23.1:2	2		fabric impressed body sherd, fine/medium sand temper: Deep Creek
23.1:3	2		residual sherd
23.1:4	1		ceramic pipe stem: fine/medium sand temper
23.1:5	1		metavolcanic shatter
23.1:6	1		cobble: quartzite

Provenience # 24.1			Description : Transect 178, Shovel Test 1
24.1:1	3		fabric impressed body sherd, fine/medium sand temper: Deep Creek
24.1:2	1		fabric impressed body sherd, coarse sand temper: Deep Creek
24.1:3	2		cord marked body sherd, shell temper: Colington
24.1:4	2		cord marked body sherd, coarse sand temper: Deep Creek
24.1:5	1		eroded body sherd, shell temper
24.1:6	14		residual sherd
24.1:7	1		translucent quartz flake fragment
24.1:8		0.9	faunal remains

SITE NUMBER : 31HF224

Provenience # 2.0			Description : Transect 174, Shovel Test 2 + 15m East, Surface
2.0:1	1		metavolcanic bifacial reduction flake

Provenience # 3.1			Description : Transect 174, Shovel Test 3
3.1:1	1		residual sherd

Provenience # 4.1			Description : Transect 174, Shovel Test 4
4.1:1	2		residual sherd
4.1:2	1		translucent quartz flake fragment

SITE NUMBER : 31HF225

Provenience # 0.0			Description : Transect 6, Shovel Test 5, Isolate 1
0.0:1	1		residual sherd

SITE NUMBER : 31HF226

Provenience # 0.0			Description : Transect 33, Shovel Test 14, Isolate 2
0.0:1	1		residual sherd: lost in field

SITE NUMBER : 31HF227

Provenience # 0.0			Description : Transect 41, Shovel Test 8, Isolate 3
0.0:1	1		residual sherd

SITE NUMBER : 31HF228

Provenience # 0.0			Description : Transect 62, Shovel Test 8, Isolate 4
0.0:1	1		metavolcanic shatter
0.0:2	1		cobalt blue bottle glass
0.0:3		11.0	unglazed brick fragments: discarded in lab

SITE NUMBER : 31HF229

Provenience # 2.1			Description : Transect 63, Shovel Test 7, Isolate 5
2.1:1	1		residual sherd

Provenience # 3.1			Description : Transect 63, Shovel Test 8, Isolate 5
3.1:1	1		metavolcanic flake fragment

SITE NUMBER : 31HF230

Provenience # 0.0			Description : Transect 42, Shovel Test 12, Isolate 6
0.0:1	1		eroded body sherd, coarse sand temper
0.0:2	1		residual sherd

SITE NUMBER : 31HF231

Provenience # 0.0 Description : Surface of Road, Isolate 7
0.0:1 1 metavolcanic projectile point: Roanoke

SITE NUMBER : 31HF232

Provenience # 0.0 Description : Transect 74, Shovel Test 5, Isolate 8
0.0:1 1 residual sherd

SITE NUMBER : 31HF233

Provenience # 0.0 Description : Transect 76, Shovel Test 2, Isolate 9
0.0:1 1 residual sherd

SITE NUMBER : 31HF234

Provenience # 0.0 Description : Transect 193, Shovel Test 4, Isolate 10
0.0:1 1 residual sherd

SITE NUMBER : 31HF235

Provenience # 0.0 Description : Transect 194, Shovel Test 8, Isolate 11
0.0:1 1 residual sherd
0.0:2 1 metavolcanic flake fragment

SITE NUMBER : 31HF236

Provenience # 2.0 Description : Transect 179, Shovel Test 6, Surface, Isolate 12
2.0:1 1 residual sherd

Provenience # 2.1 Description : Transect 179, Shovel Test 7, Isolate 12
2.1:2 1 metavolcanic thinning flake

Provenience # 3.1 Description : Transect 179, Shovel Test 7, Isolate 12
3.1:1 1 residual sherd

SITE NUMBER : 31HF237

Provenience # 0.0 Description : Transect 44, Shovel Test 1, Isolate 13
0.0:0 no cultural material

SITE NUMBER : 31HF238

Provenience # 2.1 Description : Transect 139, Shovel Test 2, Isolate 14
2.1:1 1 metavolcanic shatter

Provenience # 3.1 Description : Transect 138, Shovel Test 4, Isolate 14
3.1:1 1 residual sherd

Provenience # 4.1 Description : Transect 139, Shovel Test 3, Isolate 14
4.1:1 1 residual sherd

SITE NUMBER : 31HF239

Provenience # 0.0 Description : Transect 148, Shovel Test 2, Isolate 15
0.0:1 3 residual sherd
0.0:2 1 metavolcanic thinning flake

SITE NUMBER : 31HF240

Provenience # 0.0 Description : Transect 150, Shovel Test 3, Isolate 16
0.0:1 1 undecorated whiteware

SITE NUMBER : 31HF241

Provenience # 2.1 Description : Transect 150, Shovel Test 5, Isolate 17
2.1:1 1 net impressed rim sherd, coarse sand temper: Deep Creek

Provenience # 3.1 Description : Transect 151, Shovel Test 6, Isolate 17
3.1:1 1 residual sherd

Provenience # 4.1 Description : Transect 151, Shovel Test 6 + 15m N, Isolate 17
4.1:1 1 fabric impressed body sherd, granular temper: Mount Pleasant

SITE NUMBER : 31HF242

Provenience # 0.0 Description : Transect 152, Shovel Test 2, Isolate 18
0.0:1 1 residual sherd

SITE NUMBER : 31HF243

Provenience # 0.0 Description : Transect 193, Shovel Test 1, Surface, Isolate 19

0.0:1	1		unidentifiable stoneware: lost in field
0.0:2	1		undecorated ironstone: lost in field
0.0:3		2000.0	unglazed brick fragments: lost in field

Appendix C.

Scopes of Work

Phase I Survey of NUCOR Steel Company's Proposed Plant Site in Hertford County, North Carolina

Scope of Work

Brockington and Associates, Inc.

30 August 1998

NUCOR Steel Company is proposing to build an industrial facility on the Chowan River near Winton, Hertford County, North Carolina. A Phase I cultural resources survey of the proposed plant site will be undertaken to determine if any historically significant properties are present that may be affected by the proposed activities. This survey will entail *Background Research*, *Field Investigations*, *Laboratory Analyses*, and *Report Preparation*. Tasks associated with each of these primary activities are described below.

The project tract lies on the south bank of the Chowan River near the intersection of Bazemore (SR1445), Castlelow (SR 1445), and River (SR 1400) Roads. The tract contains approximately 990 acres. Approximately 90 acres lie in a utilities easement that extends approximately 14,500 ft westward from the tract. The remaining lands contain approximately 100 acres of wetlands (preliminary assessment) and 800 acres of uplands. Two previously recorded archaeological sites (31HF26** and 31HF27**) have been identified in the tract. Figure 1 displays the location of the project tract on the USGS Harrellsville quadrangle.

Background Research

Background Research will entail a review of the history of property ownership and land use and a review of previous cultural resources investigations in the region. Initially, the Office of the State Archaeologist (OSA) in Raleigh will be visited. Copies of the site file information on the previously recorded sites will be obtained. Reports of investigations in and near the project tract will be reviewed. OSA personnel who manage these portions of North Carolina will be interviewed to identify any ongoing projects that may have relevance to the NUCOR survey.

Records concerning the history of the project tract will be sought in the Hertford County Courthouse, offices, and library in Winton. Historic plats will be sought that may indicate where former structures or facilities were located. Special attention will be directed to identifying possible maritime facilities along the Chowan River. This information will be forwarded to Mid-Atlantic Technologies, Inc., who are conducting a remote sensing survey of the Chowan River bankline adjacent to the tract. Local historians and informants also will be contacted to determine if

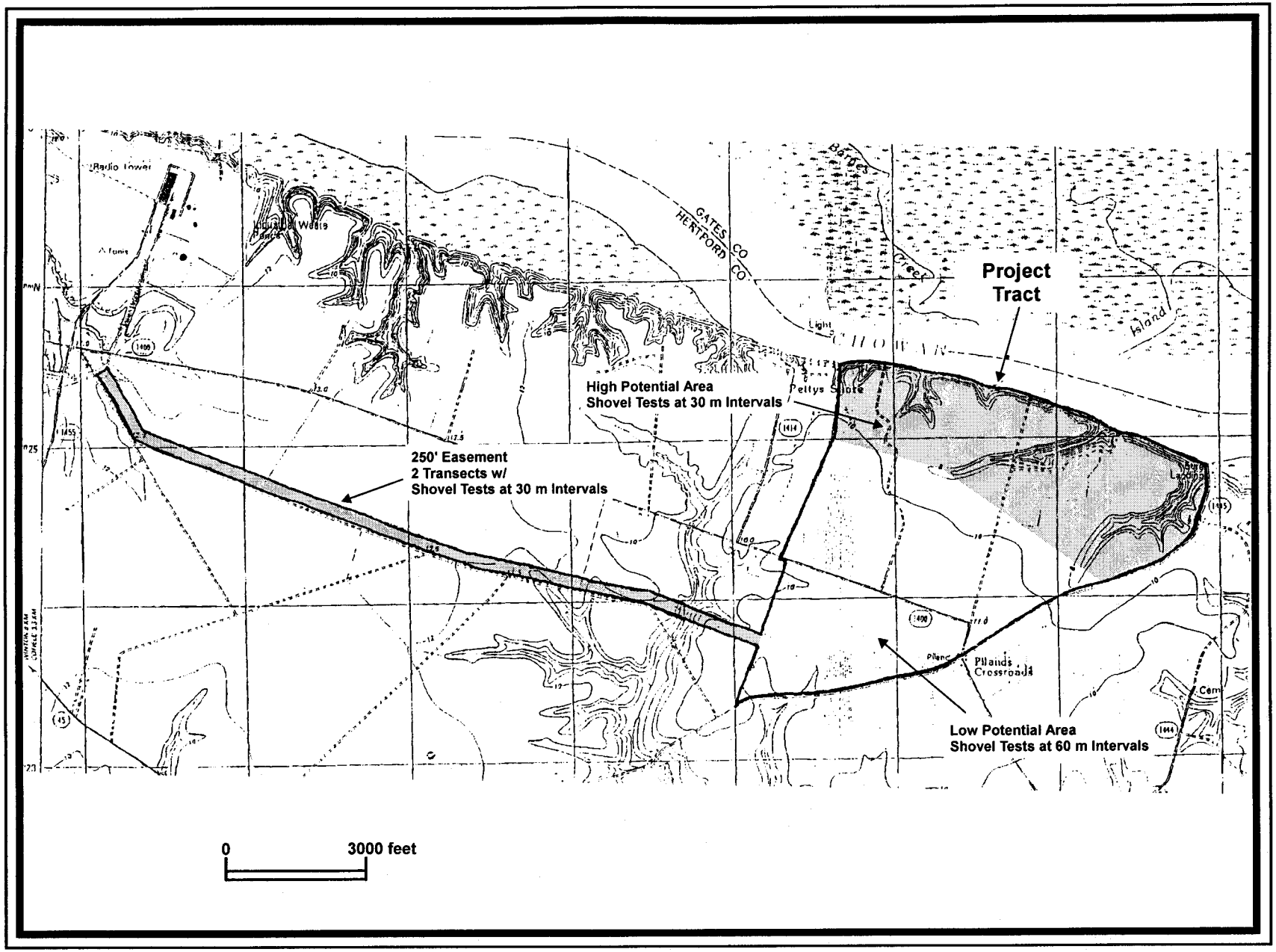

Figure 1. The location of NUCOR Steel Company's proposed plant site (USGS Harrellsville quadrangle).

undocumented sources of information are available or if unrecorded historic sites may be present on the tract. Supplemental information may be sought at the Division of Archives and History.

Information recovered during the *Background Research* will be employed to develop cultural contexts for the tract from which the significance of any historic properties on the tract can be assessed. Also, this information will be incorporated into the existing model of archaeological site potential for the tract as appropriate to insure that any potential sites may be identified.

Field Investigations

The *Field Investigations* will result in a comprehensive, systematic examination of the terrestrial portions of the project tract; a separate scope for a remote sensing survey of the Chowan River adjacent to the tract has been submitted by Mid-Atlantic Technologies, Inc. The principal cultural resources anticipated to exist within the tract are archaeological sites; two sites (31HF26** and 31HF27**, both nineteenth century historic sites) have been identified in the tract. Methods for locating any sites that may be present are described below. If historic structures (any building constructed prior to 1950) are encountered, these structures will be examined by an architectural historian and recorded appropriately.

Archaeological survey will entail the systematic examination of the uplands within the project tract. The portion of the tract adjacent to the Chowan River and two large tributaries (i.e., within approximately 1,000 ft the river and 300 ft of the tributaries) appears to possess a high potential to contain prehistoric and historic archaeological sites. The remaining uplands possess a reduced or low potential to contain archaeological sites. Figure 1 displays the high and low potential areas defined within the project tract.

The high potential areas within the tract will be examined through the pedestrian traverse of transects spaced at 100 ft intervals. All surface exposures along these transects will be inspected for cultural materials. Shovel tests, measuring approximately 1 by 1 ft, will be excavated at 100 ft intervals along these transects. Shovel tests will be excavated into sterile subsoils, anticipated to be approximately 1.5-3 ft below surface. Fill from these tests will be sifted through 0.25 inch screen to enhance artifact recovery. Information concerning soil conditions and presence/absence of cultural materials will be recorded for each test.

The low potential areas will be examined along transects spaced at 200 ft intervals. Shovel tests will be excavated at 200 ft intervals along each transects *and* in locales that appear likely to contain cultural materials (e.g., small ridges or hummocks, higher areas adjacent to small drainages or wetlands, areas that appear to have been altered by human activities). These tests will be excavated and recorded in the same fashion as described above.

The railroad easement is 250 ft wide throughout its length. This easement will be examined through the pedestrian traverse of two (2) transects spaced approximately 60 ft to either side of the

centerline of the easement. Shovel tests will be excavated at 100 ft intervals along each of these transects *and* in any areas that appear likely to contain cultural materials within the easement. These tests will be excavated and recorded in the same fashion as described above.

Concentrations of artifacts or landscape features will be defined as archaeological sites. Single artifacts or features will be defined as isolated finds. Additional shovel tests will be excavated in and around each concentration to define the limits of the site/isolate. Appropriate maps and photographs will be prepared for each site/isolate. Sufficient information will be collected for each site to permit the completion of North Carolina site forms. These forms will be submitted for the assignment of permanent sites numbers at the end of the *Field Investigations*.

Artifacts recovered during the *Field Investigations* will be placed in acid-free plastic bags and labeled by transect/shovel test number, site number, and other appropriate information. Some artifacts (brick fragments, shell, unidentifiable metal fragments) may be recorded and left in the field at the site of discovery.

In the event that human remains are encountered during the field investigations, activities will immediately halt and the appropriate local and state agencies will be contacted. Survey will not resume in the portions of the tract adjacent to the find until an appropriate course of action for dealing with these remains has been developed.

Laboratory Analyses

All artifacts recovered during the survey will be cleaned as appropriate for their media of manufacture. Artifacts will be identified using established regional typologies and published descriptions of classes of artifacts. Artifacts will be labeled by site and provenience within a site. Sufficient analyses of these artifacts will be conducted to assist in determining the age and function of individual sites. Detailed analyses of the materials are not anticipated.

All recovered materials will be prepared for permanent curation at the State of Alabama Office of Archaeological Services facility at Moundville, Alabama, or a comparable facility approved by the North Carolina State Historic Preservation Office (NCSHPO). These materials will be forwarded to the approved facility when all phases of the project are complete.

Report Preparation

A detailed report of the survey will be prepared. This report will include a description of the natural and cultural setting of the project tract, the methods employed during the investigations, and all resources identified in the project tract. Recommendations concerning the National Register of Historic Places (NRHP) eligibility of each cultural resource will be included. Resources will be defined as eligible, potentially eligible, or not eligible for the NRHP. NRHP eligibility for

archaeological sites is based on the potential for a site to generate significant information concerning the past use of the site or the region. Assessments of the effect of the construction and operation of the proposed industrial facility on these resources will be presented. Recommendations for additional investigations at NRHP eligible or potentially eligible sites also will be included.

The report will contain appropriate maps and photographs. A complete list of cited references will be included as well as appropriate appendices. Appendices will include, but are not limited to, inventories of all recovered artifacts, the resumes of the project principals, and the results of the underwater remote sensing survey to be conducted by Mid-Atlantic Technologies, Inc. A separate scope of work has been submitted for the underwater investigations.

This report will be submitted to the NCSHPO for review and comment on or about 1 October 1998. Any comments will be addressed in a final report. Upon acceptance of the final report, all notes and artifacts will forwarded to the approved facility for permanent curation.

Project Personnel

Brockington and Associates, Inc. has highly trained and skilled professionals who will conduct all phases of the project. Dr. Eric Poplin will serve as Principal Investigator. Dr. Poplin has served in a similar capacity on numerous projects throughout the Southeast, with an emphasis on South Carolina and North Carolina. Mr. Ralph Bailey (M.A.- History, The Citadel/University of Charleston) will serve as Project Historian. Mr. Bailey has conducted similar research on projects in North Carolina, South Carolina, and Virginia. Mr. Bailey also has conducted archaeological investigations similar in scope to the NUCOR site. Mr. Todd McMakin (M.A.- Anthropology, University of Southern Mississippi) will serve as Field Director. Mr. McMakin has directed similar projects in South Carolina, Florida, Alabama, and Mississippi. He has recently completed several small projects in North Carolina. Mr. McMakin will be present during all phases of the *Field Investigations*. Mr. Bailey and McMakin will be responsible for preparing the report of the survey. Resumes for these key project personnel are available.

DRAFT ER - MWR

August 3, 1998

To: Elizabeth Kountis
McKim and Creed
243 N. Front Street
Wilmington, NC 28401

From: DAH

Re: Request for underwater archaeology information concerning property shown on the Harrellsville Quadrangle Map, Herford Co., ER99-7119

On July 20, 1998, you met with Mark Wilde-Ramsing of our agency's underwater archaeology unit at Fort Fisher to discuss underwater archaeology sites that might be affected by the proposed installation of a 100-foot pier in association with the above project. A review of the site files found no recorded underwater archaeological sites in the area. However, the project area has never been surveyed to determine the existence of cultural remains. On the other hand, a review of historic maps show evidence of past shoreline use within the project area, particularly in association with the 19th century fisheries at Petty's shores.

Based on this information, we recommend that a remote sensing survey employing a magnetometer be conducted at the dock location prior to construction. This survey should cover an area at least 100 feet on either side of the proposed dock and 100 feet offshore of the end, or a 200 x 200 feet area. Lane spacing should be no more than 25 feet apart and anomalies located during the survey should be refined using additional survey passes.

Since avoidance of anomalies that may represent the most cost effective way to proceed with determining the exact location of the proposed dock, it may be

prudent to extend the survey along the shoreline several hundred feet on either side. This will allow adjustments to the dock alignment. If avoidance is not possible, we recommend that an underwater archaeological assessment of anomaly targets be conducted to determine their nature, eligibility to the National Register of Historic Places and the projected affect the project will have on them. Should this assessment determine that a site located within the project area is significant and will be affected by dock construction or shipping traffic using it after it is built, then we would recommend that a plan for mitigation of adverse affects be developed and carried out.

For the initial magnetometer, we suggest that the underwater archaeologist conducting the survey work in concert with the terrestrial archaeologists to avoid duplication of environmental and historical research.

APPENDIX E

Ground Water Supply Letters
from
Division of Water Resouces and Nucor

nucor steel

A Division of NUCOR Corporation

216 North Street
Ahoskie, North Carolina 27910

Telephone (252)332-2222
Fax (252)332-2410

November 5, 1998

Mr. Don Craft
County Manager
Hertford County

Re: Nucor Groundwater

Dear Don,

This letter is to follow up the commitment made several times in the past to the residents of Hertford County which will be adjacent to our site. As you know Nucor will recycle it's cooling water continuously, however, the steam generated when cooling steel to ambient temperature will necessitate making up water lost in our system. We anticipate this usage at something less than one million gallons per day.

This area of the state is not a capacity use area and should easily accommodate the water needed and no state permits are required. Nucor will use it's best efforts to design the well field to minimize any drawn down. Nucor does not expect there to be an impact on surrounding wells. However, if in the future problems arise caused by our withdrawals, we will work with the county to remedy the problems quickly and efficiently.

Please rest assured Nucor is going to be a good corporate neighbor.

Sincerely,

Joseph A. Rutkowski, Jr.
Vice President and General Manager

NCDENR

JAMES B. HUNT JR.
GOVERNOR

WAYNE McDEVITT
SECRETARY

JOHN N. MORRIS
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

October 19, 1998

Mr. Chad Prior
Nucor Steel
PO Box 525
Darlington, SC 29540

Dear Mr. Prior:

This letter is in response to our phone conversation of October 13, 1998. You requested additional ground water information for the proposed Nucor site in Hertford County. In the DWR letter of July 7, 1998 we indicated that the upper Cape Fear aquifer, at about 208 to 308 feet below land surface, is a good source of water. We also recommended the Beaufort aquifer, at about 100 to 152 feet below land surface. A deeper aquifer, the lower Cape Fear (at about 340 to 940 feet below land surface), has chloride concentrations above 250 parts per million. This saline ground water would not meet your needs as we understand them. We believe that the upper Cape Fear and Beaufort aquifers can supply the estimated one million gallons per day that your planned facility requires.

Water levels in the upper and lower Cape Fear aquifers are affected by large scale pumping of ground water near Franklin, Virginia at the Union Camp facility. At that site about 38 million gallons per day of ground water is withdrawn. This withdrawal causes drawdowns in ground water levels for a large area of Virginia and North Carolina (as far south as northern Bertie County). Water level declines of one-half to one foot per year are common in the North Carolina lower Cape Fear monitoring wells. Upper Cape Fear water levels are less affected and typically decline at one-half foot per year. Rates of drawdown have decreased over the last five to ten years as these aquifers are closer to equilibrium with the Union Camp withdrawal.

While we believe that Nucor can obtain adequate ground water supplies at this site, we are concerned about localized effects on other water users. In addition to the background cone of depression related to Union Camp, Perdue Farms is a significant local water user. Upon request for assistance, DWR representatives visited residents living within 1.5 miles of Perdue Farms. DWR is convinced that Perdue Farms' withdrawals affect area residents more than the prevailing trend in water level decline. These effects include the need for residents using private wells to replace wells, replace pumps, lower pump intakes, and reprime pumps. DWR has a list of 16 residents that have owned at least two and sometimes as many as four wells. These private home wells typically range from 250 to 316 feet deep (tapping the upper Cape Fear aquifer). It is DWR's understanding that the variable nature of Perdue's withdrawals can cause changes in water levels such that wells lose prime.

We are concerned that the addition of Nucor pumping will exacerbate this situation for the currently affected citizens and broaden the affected area. We encourage Nucor and Perdue Farms to offer assistance to these residents. The best approach might be to work with Hertford County to offer residents access to the County's public water supply system.

Please feel free to contact me at (919) 715-5445 to discuss this matter.

Sincerely,

Nathaniel C. Wilson

Nathaniel C. Wilson, P.G.
Ground Water Branch
Water Allocation Section

P.O. BOX 27687, RALEIGH, NORTH CAROLINA 27611-7687
PHONE 919-733-4064 FAX 919-733-3558
AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER - 50% RECYCLED/10% POST-CONSUMER PAPER

APPENDIX F

Wastewater Capacity Letters
from
Division of Water Quality
&
Town of Winton

State of North Carolina
Department of Environment
and Natural Resources
Division of Water Quality
Washington Regional Office

James B. Hunt, Jr., Governor
Wayne McDevitt, Secretary
A. Preston Howard, Jr., P.E., Director

DIVISION OF WATER QUALITY
October 15, 1998

Mr. Amos L. Moore, Jr.
The Wooten Company
301 W. 14th Street
Greenville, NC 27834

Subject: Town of Winton's WWTP, Permit No. WQ0001602
Hertford County

Dear Mr. Moore:

Per the Division records, the average annual flow for the Town of Winton is 198,700 GPD. The Town of Winton had requested the connection of an additional 16,000 GPD for 44 customers in the Oak Villa area. With the addition of 20,000 GPD from Nucor, the Town of Winton would be at a capacity of 235,700 GPD for the projected flow. This office would recommend the issuance of the sewer permit. However after the connection of the above two mentioned projects, the Town of Winton would be above the 90% capacity rule and very close to their permitted flow of 235,000 GPD. If you should have any questions or concerns, please call Robert Tankard at (252) 946-6481 ext. 233.

Sincerely,

Roy K Thomas
for Jim Mulligan
Water Quality Supervisor

Copy: WaRO
Mr. Bobby Darden, Town of Winton, POB 134, Winton, NC 27986
Mr. Kim Coleson, Non Discharge Permitting Unit
Central File
Mr. Boyce Hudson

943 Washington Square Mall, Washington, North Carolina 27889 Telephone 919-946-6481 FAX 919-975-3716
An Equal Opportunity Affirmative Action Employer

Town of Winton

P.O. Box 134 Winton, North Carolina 27986
Telephone: (252) 358-3041
Fax: (252) 358-3273

November 4, 1998

Joe Rutkowski
Nucor Corporation
216 North Street
Ahoskie, NC 27910

Dear Joe:

I just wanted to update you on the Winton Board of Commissioners November meeting in which the Board discussed the idea of Nucor attaching to the Winton sewer system. The Board was made aware of your request by myself and Town Attorney, Frank Burleson, in a closed session. They were also made aware that the Division of Water Quality has tentatively permitted the additional flow from Nucor. The DWQ letter is attached. The Board is very willing to accommodate Nucor in any way possible. There are, however, some concerns with the capacity of the wastewater treatment plant, which will become the Town's top priority in the months to come.

The Town of Winton will take immediate action to attempt to alleviate some of the infiltration and inflow problems of the system that are causing capacity problems. This will include assisting the Town of Cofield with their system as well.

The Board did request that Nucor provide as much detailed information on the proposed sewer line as possible so the Town can consult with the Town's engineer, Bucky Moore of the Wooten Company.

If you have any questions or need additional information, please contact me at the Winton Town Hall. The Town of Winton looks forward to a long and prosperous relationship with Nucor Corporation.

Sincerely,

Bobby C. Darden

Bobby C. Darden
Town Administrator

Enclosure

APPENDIX G

Letter from White Stack Maritime Corporation

WHITE STACK MARITIME CORP.

P.O. BOX 627 • CHARLESTON, SC 29402 • TEL 843.577.6556 • FAX 843.723.5431

October 22, 1998

Mr. Joseph A. Rutkowski
Nucor Steel
216 North Street
Ahoski, North Carolina 27901

Re: Proposed Nucor Steel Mill
Hertford County, North Carolina

Dear Mr. Rutkowski:

As a follow up to our discussions, I am writing to introduce our company and to submit a proposal which outlines the operation of an inland transportation system, utilizing shallow draft tugs and barges, for material delivery to your proposed mill in Hertford County.

Before discussing our transportation proposal, I would like to give you a very brief introduction to our company. White Stack Maritime Corp. has a history of operating tugs and barges dating back to the late 1800's. Recently, White Stack completed a merger with Moran Towing Corporation, a well-established firm with a very long tradition of outstanding service. The combined operations of the two companies will offer our customers unsurpassed service.

We are presently evaluating the merits of operating an inland barge service to meet your transportation requirements from the port(s) of Morehead City, N. C. and/or Norfolk, Va. At this time, regardless of the deep-water port chosen, the characteristics of the equipment utilized for the service will include the following:

Tugs:	Length overall	75 feet
	Beam	30 feet
	Deep draft	8 feet
Barges:	Length overall	195 feet
	Beam	35 feet
	Deep draft	9 feet
	Capacity	1,500 tons

Typically, one tug will push a tow consisting of two barges in a "round robin" fashion. The tug will depart the deep-water port with two loaded barges, transport the barges to the mill, drop them, and pick up two empty barges for transport back to the deep-water port. At this time, we do not envision more than two barges moored at the mill at any one time.

We plan to utilize hopper barges for the service. We feel the hoppers will offer a containment system for the material transported. In addition, the hopper barges are in essence a double hulled vessel.

The barge will maintain buoyancy with a penetration to its shell plating. We plan to conduct maintenance and repair activities on the floating equipment at the deep-water port(s).

We submit the following two navigation plans as the route(s) we may take from the deep-water port(s) under consideration.

The route from Morehead City to the Nucor site will begin near the Morehead City turning basin. The project depth in the basin is 35 feet. From the turning basin the tow will proceed north up the Newport River and into the Adams Creek canal. Project depths in this area are 12 feet. From Adams Creek the tow will proceed into the Neuse River and travel north for a distance of 17.5 miles to the Neuse River Junction. The controlling depths on the Neuse River are greater than 16 feet. From the Neuse River Junction the tow will turn northwest and proceed up the Bay River. Controlling depths in the Bay River exceed 13 feet. From the Bay River the tow will proceed north up Gale Creek to Goose Creek and into the Pamlico River. The project depth through this area is 12 feet. From the Pamlico River the tow will proceed north up the Pungo River to the Alligator River - Pungo River canal. The tow will proceed north through the canal to the Alligator River. The project depth in these areas is 12 feet. Upon reaching mile marker 80, the tow will proceed west on Albemarle Sound for a distance of 35 miles. The depths in this area exceed 13 feet. From Albemarle Sound the tow will transit the Chowan River to the Nucor mill site. The controlling depth on the Chowan River exceeds 13 feet.

The route from Norfolk to the Nucor site will begin on the Southern Branch of the Elizabeth River. The project depth in the Southern Branch is 35 feet. From the Southern Branch the tow will proceed south through the Albemarle and Chesapeake canal to the North Landing River. Traveling south on the North Landing River, the tow will proceed through Currituck Sound to Coinjock, N. C. From Coinjock, the tow will proceed south on the North River to Albemarle Sound. The project depth for this area is 12 feet. Upon entering Albemarle Sound, the tow will turn west and proceed approximately 35 miles to the Chowan River. The controlling depth in Albemarle Sound is greater than 13 feet. Upon entering the Chowan River, the tow will proceed approximately 25 miles up river to the mill site. The controlling depth on the Chowan River exceeds 13 feet.

Our successful experience on the above routes demonstrates the feasibility of our proposed inland barge transportation system.

We look forward to working with you on this exciting project. If we may provide additional information, please do not hesitate to call.

Sincerely,

Timothy H. West

Timothy H. West
Vice President

APPENDIX H

Letter from David J. Joseph Company

The David J. Joseph Company

November 11, 1998

Mr. Joseph A. Rutkowski
Vice Pres. and General Manager
Nucor Steel/Hertford County
216 North Street
Ahoskie, NC 27910
Fax: 252-332-2410

Dear Joe:

As you are aware, progress is being made regarding the establishment of a transload facility for ocean going vessels and Jones Act ocean barges. While we are not in a position to make definitive decisions, we have reviewed numerous existing facilities in the Norfolk, VA and Morehead City, NC area. At this point, existing dock facilities appear to be adequate for the potential transload to Tunis, NC.

The following are a few of the facilities that may assist us in transloading to Tunis: Lambert Marine Terminals in Norfolk; Elizabeth River Terminal in Norfolk; the Port of Morehead City, NC; or the Radio Island location in Morehead City, NC. We are currently negotiating and developing proposals from all involved as to further substantiate the best opportunity available for Nucor Steel/Hertford County.

Please advise any questions or concerns regarding transload opportunities and expect further information to follow.

Best regards,

Jeffrey S. Allman

Philadelphia District Office
The David J. Joseph Co.
P.O. Box 673
Southeastern, PA 19399-0673
Area Code 610/688-6960
FAX 610/687-2937

Executive and General Offices
300 Pike Street
Cincinnati, Ohio 45202-4214

District Offices
Birmingham
Charlotte
Chicago
Cincinnati
Houston
Omaha
Philadelphia
Pittsburgh
Portland
Portlin
Salt Lake City
St. Louis
Tampa

APPENDIX I

Letter from Carol M. Browner, EPA Administrator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 14 1998

THE ADMINISTRATOR

Mr. Steve Rowlan
Environmental Engineer
NUCOR Steel
P.O. Box 100
Plymouth, UT 84330

Dear Mr. Rowlan:

On behalf of the U.S. Environmental Protection Agency (EPA), thank you for the time and effort that you have given over the past three and a half years as a member of the Iron and Steel Subcommittee of the Common Sense Initiative (CSI) Council. We especially appreciate your efforts working with Utah to develop a model consolidated, multi-media report that might be used by a mini mill to report environmental data electronically and your help in arranging for a tour of a NUCOR facility.

CSI has been one of EPA's pilot efforts in developing alternative approaches to environmental management and in soliciting early multi-stakeholder involvement in decision-making. We believe it has resulted in many products of which we can be proud, especially in the iron and steel sector. It has also significantly enhanced communication among all stakeholders involved in environmental protection, and has taught all participants about how to work better with different stakeholder groups. EPA will be looking at the lessons learned from CSI and the Iron and Steel Subcommittee as it develops and implements future sector-based and stakeholder activities. We appreciate your helping us advance these concepts.

Please feel free to share with us any future ideas that you may have regarding the sector-based approach and, especially, how we might promote better environmental management of the steel making industry.

Again, thank you for your participation. We very much appreciate your candor and perseverance.

Sincerely,

Carol M. Browner

Carol M. Browner

APPENDIX J

Economic Impact of the Nucor Steel Recycling Plant

The Economic Impact of the Nucor Steel Recycling Plant

On Northeastern North Carolina

Prepared By:
Professor Stephen Layson
Bryan School of Business and Economics
University of North Carolina at Greensboro
Post Office Box 26165
Greensboro, NC 27402
Phone: 336/334-5463
Fax: 336/334-4089
e-mail: layson@uncg.edu

July 1998

Prepared For:
North Carolina's Northeast Partnership
Post Office Box 29
Edenton, NC 27932

Economic Impact of the Nucor Plant: Summary

Methodology
This study estimates the economic impacts of the new Nucor Steel Recycling plant on the 6-county Northeastern, North Carolina region consisting of Bertie, Chowan, Gates, Halifax, Hertford, and Northhampton Counties. The methodology used in this study is similar to that used by Professor Jud in his recent study of the economic impacts of the FedEx Hub[1] on the Piedmont Triad region of North Carolina. Both of these studies use the Regional Input-Output Modeling System (RIMS II) developed by the U.S. Bureau of Economic Analysis, and both studies estimate annual average and cumulative economic impacts over the 15-year period from 1999 to 2013.

Assumptions
Location of the Nucor facility in Hertford County will directly create 300 jobs with total wages of $20 million per year. Nucor will also spend $101 million per year on other inputs (natural gas, electricity, supplies, etc.) purchased within the region.

Nucor will spend $35 million on construction of the new facility beginning in 1999. State, local, and federal expenditures on infrastructure are assumed to total $107.6 million.

By 2004 Nucor will be operating at full capacity with an annual operating budget of $330 million.

Total Economic Impacts
The average annual economic impact of the Nucor facility over the next 15 years is $398 million per year. Over the next 15 years the cumulative economic impact on the region will be nearly $6 billion.

Employment Impacts
The construction and operation of the Nucor facility will generate an annual average of 4,396 new full time jobs both directly and indirectly in related industries. The 4,396 new jobs will generate an additional $118 million in annual income for the household sector.

Tax Impacts
The additional income generated by the Nucor plant will yield extra tax revenue for the state of North Carolina and local governments in the region. Not including State corporate income tax revenue, it is estimated that State tax revenue will increase by more than $7 million per year. Local sales tax revenue within the region is estimated to increase by more than $800 thousand per year.

Linkage Effects
The economic impacts summarized above do not include the effects of other firms that may relocate to the region because of Nucor. For example, in Berkley, SC, 13 new companies have located or committed to locate there as a result of Nucor's new plant. These companies plan to invest $160 million and employ 550 people at an average salary of $44,000 per year. This study also does not include any impacts from the construction of new housing and apartments that is likely to occur as a result of the increased employment from Nucor's location in Hertford County.

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[1] See *"The Economic Impact of the FedEx Mid-Atlantic Hub on the Piedmont Triad,"* by G. Donald Jud, Bryan School of Business & Economics, UNCG, Greensboro, NC 27412.

I. Methodology

This study estimates the economic impact of the Nucor facility on the economy of the 6-county region of Northeastern North Carolina consisting of Bertie, Chowan, Gates, Halifax, Hertford, and Northhampton Counties. This study uses the Regional Input-Output Modeling System (RIMSII), developed by the U.S. Bureau of Economic Analysis. This model estimates the inter-industry effects of the increased spending generated by the new Nucor plant.[2] The RIMSII multipliers shown below show how autonomous increases in spending or employment in the relevant sectors effect the regional economy:

Sector	Final Demand Multipliers			Direct Effect Multipliers	
	Output	Earnings	Employment	Earnings	Employment
Construction	1.5174	.4694	21.2	1.5243	1.5964
Fabricated Plate Work	1.4362	.4269	15.7	1.4632	1.6335

The final demand multipliers for output and earnings show the total dollar change in regional output and household earnings that occurs for each dollar of additional output by the corresponding row sector. The final demand multipliers for employment show the number of additional jobs created in all sectors of the regional economy for each million dollars of spending by the row sector. The direct effect multiplier for earnings shows the total additional earnings for all sectors of the regional economy for each dollar of extra earnings in the row sector. The direct effect multiplier for employment shows the total number of new jobs created in all sectors of the regional economy for each new job created in the row sector.

The final demand multipliers for output and earnings show that each dollar of additional output by the Nucor plant will add $1.5174 to regional output and $.4269 to regional household earnings. The increase in regional output is referred to as the "total economic impact" of the Nucor plant. The earnings direct-effect multiplier for the Nucor plant indicates that each dollar of earnings paid by Nucor generates $1.4632 of additional household income for the region.

II. Application of RIMSII Model to the Nucor Plant

Nucor officials estimate that construction costs for the new Nucor plant will be $35 million, excluding the cost of machinery and equipment. Once fully operational, the Nucor plant will employ 300 people paying between $60,000 and $70,000 per year. It is anticipated that Nucor will spend $101 million per year on other inputs (natural gas, electricity, supplies etc.) locally.

In addition to Nucor's construction and operational expenditures, there will be a substantial amount spent on infrastructure investments. The Nucor facility will require $1.3 million in rail improvements, excluding the cost of land. An extension of a high-pressure gas line will cost $935,000. Electrical improvements for the Nucor plant will cost $5 million. Sewer improvements will cost $400,000. Finally, it is estimated that expenditures on improvements in Highway 158 will be $100 million.

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[2] U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMSII)*, Third Edition, (Washington, DC: 1997)

Construction of the Nucor plant is assumed to begin in January 1999 and take 18 months for completion. Operation of the Nucor plant is assumed to begin in mid-2000 and reach full capacity in 2004. Except for the highway improvement, the infrastructure expenditures are assumed to occur over the same 18-month period as the Nucor plant construction. The highway improvements are assumed to begin in 1999 and be completed in 2002.

Because the economic effects of this facility are spread out over time, this study calculates the average annual impacts of the facility over the 15-year period 1999-2013. Table 1 shows the assumed timing of the expenditures along with their economic impacts over the next 15 years. The economic impacts on employment and earnings are calculated by multiplying the expenditures for construction and operation of the facility times the appropriate RIMSII multipliers given in section I of the study. Construction expenditures include both the cost of building the Nucor plant and the cost of the associated infrastructure. Operating expenditures include employee costs and all other input costs.

Table 1
Economic Impacts of the Nucor Plant

	Construction		Operation	Economic Impacts		
Year	Nucor Bldg	Other		Employment	Earnings	Total Impact
1999	23,333,333	30,089,995		1,133	25,076,910	81,064,558
2000	11,666,667	27,545,005	33,000,000	1,349	32,493,659	106,894,391
2001		25,000,000	132,000,000	2,602	68,085,800	227,513,400
2002		25,000,000	247,500,000	4,416	117,392,750	393,394,500
2003			297,000,000	4,633	126,789,300	426,551,400
2004			330,000,000	5,181	140,877,000	473,946,000
2005			330,000,000	5,181	140,877,000	473,946,000
2006			330,000,000	5,181	140,877,000	473,946,000
2007			330,000,000	5,181	140,877,000	473,946,000
2008			330,000,000	5,181	140,877,000	473,946,000
2009			330,000,000	5,181	140,877,000	473,946,000
2010			330,000,000	5,181	140,877,000	473,946,000
2011			330,000,000	5,181	140,877,000	473,946,000
2012			330,000,000	5,181	140,877,000	473,946,000
2013			330,000,000	5,181	140,877,000	473,946,000
	Annual average over 15-year period			**4,396**	**118,573,895**	**398,325,217**
	Cumulative total over 15-year period					**5,974,878,249**

Note: Except for the year and the employment columns, all figures in table 1 are measured in dollars.

III. Economic Impacts

Total Economic Impact

The total economic impact of the Nucor plant is calculated by multiplying value of their annual production by 1.4362, the final demand multiplier for their output. To this total is added the total impacts on regional output of the expenditures for construction. Accordingly, the total economic impact is estimated to be $398 million per year. The cumulative economic impact over the next 15 years is estimated to be nearly $6 billion dollars.

Employment and Earnings
The number of new jobs generated by the Nucor facility is calculated by multiplying the value of it's output (measured in millions of dollars) times 15.7, the final demand multiplier for employment for the Nucor facility. To this total is added the employment effects of the construction expenditures. Accordingly, the Nucor facility will create an average of 4,396 full time jobs both directly and indirectly in the region over the next 15 years. The new jobs will generate an average of $118,573,895 per year in additional household regional income.

State and Local Taxes
The increase in regional income generated by Nucor will lead to increases in State and local tax revenue. In assessing the impact of the Nucor facility on tax revenue, taxes that are paid by Nucor to the state government are ignored because these taxes are likely to be rebated to Nucor either directly or indirectly in the form of services. Also ignored is any increase in corporate taxes paid by other firms who are likely to relocate to the region because of Nucor. Finally, this study does not attempt to estimate the increase in local property taxes generated by the Nucor induced increase in employment.

The additional state income tax revenue ($5,217,251) is calculated by applying the average state tax rate of 4.4% to the estimate of additional regional income generated by the Nucor plant. The average tax rate was obtained from the NC Department of Revenue.

The State sales tax revenue ($1,853,276) is calculated as follows. Disposable income is assumed to be 84.6% of gross income. The marginal propensity to consume out of disposable income is assumed to be .9. The 4% North Carolina sales tax is assumed to apply to 45.844% of additional consumer expenditures. In addition, 7.3% of the additional consumer expenditures were assumed to be subject to a 3% state tax.[3]

The local sales tax revenue ($827,779) is calculated by applying the 2% local tax rate to the same 45.844% of additional consumer expenditures used to calculate state sales tax revenue.

Industrial Linkages and Other Long-Run Effects
In addition to the economic impacts estimated in this study, the location of the Nucor Steel Recycling Plant in Hertford County is likely to have other beneficial economic effects that have not been estimated by this study. For example, in Berkley, SC, 13 new companies have either located or plan to locate near Berkley as a result of Nucor's plant there. It is projected that these companies will invest $160 million in the Berkley region and will directly create 550 new jobs averaging $44,000 per year.[4]

It is also likely that the additional employment and income generated by the new Nucor plant will spur new housing and apartment construction in the region. The effects of this new construction have not been included in this study. Also not estimated by this study is the likely increase in local property tax revenue that will occur as a result of the increase in regional employment and housing values.

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[3] See *"The Economic Impact of UNCG on the Piedmont Triad,"* p. 37, by Aparna Gopalan, (Greensboro, NC: UNCG, Center for Applied Research, ECO970801).
[4] This information was provided me by Cathy Scott of North Carolina's Northeast Partnership, Edenton, NC, 27932.

APPENDIX K

Letters of Support

EVA M. CLAYTON
1ST DISTRICT, NORTH CAROLINA

COMMITTEES:
AGRICULTURE
SUBCOMMITTEES
SPECIALTY CROPS AND NATURAL RESOURCES
ENVIRONMENT, CREDIT AND RURAL DEVELOPMENT
DEPARTMENT OPERATIONS AND NUTRITION
SMALL BUSINESS
SUBCOMMITTEES:
PROCUREMENT, TAXATION AND TOURISM
RURAL ENTERPRISES, EXPORTS AND THE ENVIRONMENT

PRESIDENT
DEMOCRAT FRESHMAN MEMBERS

Congress of the United States
House of Representatives
Washington, DC 20515-3301

WASHINGTON OFFICE:
222 CANNON BUILDING
WASHINGTON, DC 20515
(202) 225-3101

DISTRICT OFFICES:
134 N. MAIN STREET
WARRENTON, NC 27589
(919) 257-4800

400 WEST 5TH STREET
GREENVILLE, NC 27834
(919) 758-8800
1-800-274-8672

January 6, 1998

Mr. F. Kenneth Iverson
Chairman
Nucor Corporation
2100 Rexford Road
Charlotte, North Carolina 28211

Dear Mr. Iverson:

I was excited to learn that Nucor Steel is considering a location in Hertford County for a steel recycling facility. I am pleased to go on record with my full, unwavering endorsement of Hertford County for this possible new investment of quality jobs in Eastern North Carolina. I can easily envision a successful and thriving operation in Hertford County with its prime location on the Chowan River, strong workforce, and commitment to economic development.

I also have a deep commitment to the economic development of Eastern North Carolina, including Hertford County. The citizens of this area have a very strong work ethic and desire the opportunity to enhance their employment opportunities. I am quite familiar with the Nucor Bearing Products operation in Wilson County, and am quite certain that the proposed Nucor steel recycling facility will be a bright ray of hope for Hertford County and the surrounding areas.

I know you will give the Hertford County site your utmost consideration. If my office can be of assistance to your company in any way, please do not hesitate to contact me.

Sincerely,

Eva M Clayton

Eva M. Clayton
Member of Congress

EMC:ltj

PRINTED ON RECYCLED PAPER

JESSE HELMS
NORTH CAROLINA

United States Senate

WASHINGTON, DC 20510-3301

December 16, 1997

Mr. F. Kenneth Iverson
Chairman
Nucor Corporation
2100 Rexford Road
Charlotte, North Carolina 28211

Dear Mr. Iverson,

It is my understanding that Hertford County is under consideration as the site for a proposed Nucor steel recycling facility. It is an honor to join those supporting a Hertford County facility.

Earlier this year, I met with the officials in the Northeastern region of North Carolina and came away quite impressed by their commitment to economic development. This sometimes overlooked region possesses remarkable potential evidenced by its strong workforce and committed leaders. Naturally, the folks in Hertford County are eager to bring a company of Nucor's prominence to the region and I suspect a Nucor facility would be a "win-win situation."

In any event, I know you folks will give the Hertford County site all due and proper consideration. Please do not hesitate to give me a call if I can ever be of assistance to you and Nucor.

Kindest personal regards.

Sincerely,

Jesse Helms

JESSE HELMS:wsp

NORTH CAROLINA GENERAL ASSEMBLY
PRESIDENT PRO TEMPORE
SENATOR MARC BASNIGHT
RALEIGH 27601-2808

January 7, 1997

The Honorable Governor James B. Hunt, Jr.
116 West Jones Street
Raleigh, NC 27603-8001

Dear Governor Hunt:

It has come to my attention that you and Secretary Norris Tolson have recently been meeting with representatives of Nucor regarding locating a major recycling facility in Hertford County. I wholeheartedly endorse and support any endeavors to bring high skill and high paying jobs to the Northeast. I feel confident that the myriad economic development incentives included in the William S. Lee Act render Hertford County a highly attractive choice.

I understand additional legislation may be beneficial in securing the location of this new facility in North Carolina. Please be assured that I am more than happy to consider any legislation, including legislation as proposed in other states, that will bring Nucor or any other industry with good quality jobs to the Northeast. I am delighted to extend the assistance of my staff and myself to any and all of these efforts.

I sincerely hope Nucor locates their facility in North Carolina. It is always a pleasure to work together to bring new jobs and opportunities to our citizens.

Sincerely,

Marc Basnight

cc: Secretary Norris Tolson

mb:sg

1ST DISTRICT • STATE LEGISLATIVE BUILDING • RALEIGH, NORTH CAROLINA 27601-2808 • TEL (919) 733-6864 FAX (919) 733-8740

State of South Carolina

Office of the Governor

DAVID M. BEASLEY
GOVERNOR

POST OFFICE BOX 11369
COLUMBIA 29211

September 14, 1998

Mr. William Early
Hertford County Economic Development Commission
Post Office Box 429
Winton, North Carolina 27986

Dear Mr. Early:

Thank you for your letter of August 26, 1998. I appreciate your taking the time to contact me.

We are indeed fortunate to have Nucor Corporation in South Carolina, as it is one of our leading corporate citizens. Nucor is very conscious of environmental issues and works tirelessly toward environmental stewardship in the communities where it is located.

Congratulations on Nucor's recent investment in your county. I am sure they will make a positive impact in North Carolina.

Once again, thank you for taking time to write. If you need assistance in the future, please feel free to contact me.

Sincerely,

David M. Beasley

David M. Beasley

State of South Carolina

Office of the Governor

DAVID M. BEASLEY
GOVERNOR

POST OFFICE BOX 11369
COLUMBIA 29211

August 28, 1998

Mr. William Early
Director
Hertford County Economic Development Commission
Post Office Box 429
Winton, North Carolina 27986

Dear Mr. Early:

I am writing to you in response to your questions about our experiences with Nucor Corporation here in South Carolina. We are aware that your questions arise because of the proposed siting of a major Nucor facility in your county. While I wish Nucor had a chosen to site the plate mill in South Carolina, I do congratulate you and the state of North Carolina for attracting this major facility.

First, let me say that I am a big Nucor fan and have been for some time. I grew up and lived in Darlington. My family and I lived in a house within five miles of Nucor Steel South Carolina. I personally know many Nucor employees, and Nucor has always been very active in the local community. One of my first official acts after my inauguration as Governor of South Carolina in 1995 was to meet with Nucor officials to begin the recruitment process that ultimately resulted in Nucor's siting its $500 million sheet mill facility in Berkeley County. As you know, Nucor's investment in the four facilities, and the employees' wages are extremely high. The indirect economic impact from these facilities is tremendous.

As Governor of South Carolina, it has been my observation that Nucor has been an excellent corporate citizen and environmental steward. In this regard, it is my understanding that Nucor, in cooperation with the Lord Berkeley Conservation Trust and the Palmetto Conservation Foundation, is in the process of creating with a creating a 5,000 acre conservation easement at the Nucor Steel Berkeley facility near Charleston.

I am happy to respond to your questions, and I hope that my letter answers those who have questions with regard to Nucor.

Sincerely,

David M. Beasley

David M. Beasley

City of Jewett

Incorporated September 1, 1890

August 26, 1998

Mr. Bill Early
Hertford County
P. O. 429
Winton, North Carolina 27986

Dear Mr. Early:

It's a pleasure to provide information on Nucor Steel to your community. We are grateful that Nucor decided to locate in our area.

Nucor employs approximately 420 people with an annual salary of $26 million. Additionally, they maintain 80 contract personnel at all times. As you can see they are a major employer for our area. Our people not only benefit from having a local employer but the children of employees have an automatic scholarship when they graduate from high school. At Christmas time, Nucor identifies needy families and provides gifts and clothes for the children.

Nucor is self-sufficient on water and sewer systems. They should have no impact on a water source in your area. We are not aware of any environmental problems caused by the Plant or its operation.

Each year Nucor gives assistance to the Volunteer Fire Department, the EMS, all youth organizations and to local high schools. For the City, we are proud to boast of a large Park made possible by the support of Nucor. They purchased the land, provided all the steel, purchased and donated the metal siding for the Pavilion and furnished some of the equipment in building the Park. We know we would not have this Park were it not for their support and generous donations.

We cannot speak too highly of Nucor nor can we ever show enough gratitude to repay all they have done for our town and surrounding towns. Your community would derive more benefits than detriments should you have this Company build in your area.

P.O. Box 189 • Jewett, Texas 75846-0189 • (903) 626-4416 • Fax (903) 626-4422

Should you need any additional information or have any further questions, please feel free to call.

Sincerely,

HERMAN HAMMOND
Mayor, City of Jewett

City of Blytheville

City Hall • Second & Walnut Streets • Blytheville, Arkansas 72315 • (501) 763-3602

Office of the Mayor
Joe H. Gude

August 27, 1998

Mr. Bill Early
Hertford County
P. O. Box 429
Winton, North Carolina 27986

Dear Mr. Early:

Nucor Steel began building its first plant in Blytheville, Arkansas, in 1987. Operation started up at this mill on July 4, 1988. The company decided to locate in Blytheville at a time when the city was desperately in need of good jobs for many of its people. Not only did Nucor Steel provide the jobs for these people, but also the company brought a lot of good citizens along with it.

The impact to our economy has been great. Nucor has 420 employees with an annual salary of $21,000,000. Quite a few companies related to the steel industry have also come into our area because of the convenience for them in being close to Nucor.

Nucor has been a benefactor in many other ways. As with many other cities, Blytheville has been concentrating on improving our downtown area to preserve that aspect of our community. They provided the steel, labor, and everything necessary to have several ornamental arches erected downtown. Also, they furnished the materials and labor to have several family-size pavilions built in our community park.

One of the most important ways in which the company has committed its support to Blytheville is that it has helped numerous times to provide matching funds so that we might obtain government grants in different areas.

Our young people have benefited from their many contributions in a special way also. All children of employees of Nucor are awarded scholarships upon their graduation from high school. Through the years they have sponsored baseball programs. Last year they sponsored the American Legion baseball team. Many young men from Blytheville have been able to attain scholarships to colleges because of Nucor's assistance to these programs.

These are just a few of the ways in which this company has assisted our city in its growth and development. They have helped in countless ways in both large and small projects.

We cannot speak too highly of Nucor nor can we ever show enough gratitude to repay all they have done for our town and surrounding towns. They have certainly been an asset. We do not know of any adverse conditions that have developed in this area because of their being here.

We are glad to have this opportunity to let you know how we appreciate this fine company.

Sincerely,

Joe H. Gude
Mayor

JHG/em

Town Of Ahoskie

201 West Main Street
Post Office Box 767
Ahoskie, North Carolina 27910

Phone (919) 332-5146
Fax (919) 332-1643

RESOLUTION
SUPPORTING NUCOR CORPORATION
LOCATING IN HERTFORD COUNTY

WHEREAS, the Town Council of the Town of Ahoskie encourages the economic development of Hertford County for the benefit of all of its citizens; and

WHEREAS, the Hertford County Economic Development office, the North Carolina Northeast Partnership, the North Carolina Department of Commerce and many other local and state officials have successfully recruited Nucor Corporation to locate a $300 million steel recycling facility in Hertford County; and

WHEREAS, the Town Council of the Town of Ahoskie feels that Nucor Corporation is an environmentally responsible company and that as a good corporate citizen they will have a positive and dynamic economic impact on Herford County and all of northeastern North Carolina.

NOW, THEREFORE, BE IT RESOLVED that the Town Council of the Town of Ahoskie supports and welcomes Nucor Corporation in their endeavor to locate their facility in Hertford County; and

BE IT FURTHER RESOLVED that the Town Council of the Town of Ahoskie supports the positive decisions necessary to allow Nucor Corporation to locate in Hertford County.

ADOPTED by unanimous vote of the Town Council on this the 25th day of August 1998.

Arthur L. Wiggins, Mayor

ATTEST:

Evelyn Howard, Town Clerk

Town of Winton

P.O. Box 134 Winton, North Carolina 27986
Telephone: (252) 358-3041
Fax: (252) 358-3273

RESOLUTION IN SUPPORT OF REZONING DESIGNATED PROPERTY IN HERTFORD COUNTY TO "HEAVY INDUSTRIAL' TO ACCOMMODATE A NUCOR STEEL RECYCLING FACILITY

WHEREAS, the Board of Commissioners of the Town of Winton encourages the economic development of Hertford County for the benefit of all its citizens; and

WHEREAS, Hertford County is classified among North Carolina's top ten economically distressed counties by the North Carolina Department of Commerce; and

WHEREAS, the 1998 North Carolina General Assembly, in an overwhelmingly bipartisan effort, created economic incentives to facilitate the location of major industries and businesses in economically distressed areas such as the Roanoke-Chowan region; and

WHEREAS, Nucor Steel, the United States' second largest steel manufacturer, has chosen Hertford County as the proposed site of a $350 million steel recycling facility; and

WHEREAS, Nucor Steel successfully operates eight steel recycling facilities throughout the United States within the parameters of state and federal environmental law.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of the Town of Winton enthusiastically supports the rezoning of the 900 acre site located southeast of Petty Shores on the south bank of the Chowan River to "Heavy Industrial" for the purposes of accommodating the Nucor Steel recycling facility.

ADOPTED by unanimous vote of the Board of Commissioners on this the 5th day of October 1998.

Calvin S. Hall

Calvin S. Hall, Mayor

ATTEST:

Catheline D. Parker

Catheline Parker, Town Clerk

Town of Winton

P.O. Box 134 Winton, North Carolina 27986
Telephone: (252) 358-3041
Fax: (252) 358-3273

RESOLUTION
SUPPORTING NUCOR CORPORATION
LOCATING IN HERTFORD COUNTY

WHEREAS, the Board of Commissioners of the Town of Winton encourages the economic development of Hertford County for the benefit of all its citizens; and

WHEREAS, the Hertford County Economic Development office, the North Carolina Northeast Partnership, the North Carolina Department of Commerce and many other local and state officials have successfully recruited Nucor Corporation to locate a $300 million steel recycling facility in Hertford County; and

WHEREAS, the Board of Commissioners of the Town of Winton feels that Nucor Corporation is an environmentally responsible company and that as a good corporate citizen they will have a positive and dynamic economic impact on Hertford County and all of northeastern North Carolina.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of the Town of Winton supports and welcomes Nucor Corporation in their endeavor to locate their facility in Hertford County; and

BE IT FURTHER RESOLVED that the Board of Commissioners of the Town of Winton supports the positive decisions necessary to allow Nucor Corporation to locate in Hertford County.

ADOPTED this the 5th day of October, 1998.

Calvin S. Hall

Calvin S. Hall, Mayor

ATTEST:

Catheline D. Parker

Catheline D. Parker, Town Clerk

Dear Mr. Craft,

It is a very fortunate project you are involved in. Nucor is a sound corporation that will be an asset to any community. My experience with them has been positive over the years, and I am sure their relation with any community will also garner similar feelings. The projects I worked on at Nucor had to include their policies of environmental sensitivity and consideration towards personnel. They where well ahead of contemporary trends.

My projects involved updating billet handling equipment, and a scale (special type of iron oxide build up) removal system. Individuals that would work and maintain the equipment had input on these projects. It was company policy. My year at the Darlington facility was a very enjoyable experience. I often queried them about special detailed information on structural steel and have always had my questions answered.

I generally work under contract as a machine designer. My projects have ranged from laboratory equipment used at Georgia Tech, to specialized submarines for the navy seals. My duties have included fabrication and installation of many these projects.

Throughout my years of work, I have had the good fortune to help shape the course of several industries. I do this through one of my most basic beliefs: to bring about change, work within an existing system. Society as well as corporations strongly resists outside influences. After becoming familiar with methods and practices of the industry, I develop methods and techniques that are financial and environmentally conscious. This work has lead to two patents, nomination in "The National Citation of Who's Who" (in the Environment), and rewriting the fundamental concepts of fluid stream particle break-up theory. This was for the paper and pulp industry. Another industry of concern is lead /acid battery production. Batteries made in third world countries have nothing like OSHA to govern safety precautions. I was part of a team that developed automated machinery to mix lead oxide and sulfuric acid. It was now cheaper and much more reliable then current production methods. Production was usually done by hand with no protection.

It is with similar consideration that I approach any project. The facility that Nucor wants to build fits well with my concerns. They will be reprocessing graded scrap. The scrap has already been refined, smelted, and passed industrial alloy standards. The product Nucor will be producing will have the same alloys. By using a graded type of scrap steel, they avoid any refining steps and the subsequent problems of handling the extracted contaminating materials. Their main concerns

will be clinchers and a lot of dust. Bag houses emptying into railroad cars will eliminate and remove dust. The clinkers are used for gravel. Clinkers weigh less then stone so are cheaper to move. Clinkers are also sold as lava rocks for a gas fired grill. Most people are unaware of what they are cooking their steaks over!

A community has an obligation to protect itself. They have the right to question and investigate anything that may jeopardize them. It is unfortunate that a thorough investigation is rarely carried out. Generally there are just a few individuals that create a furor out of fear and ignorance. If someone is willing to stand before them, answer their questions and discuss their fears, much of the clamor and furor will die. That person will have to be willing to accept the emotional outburst directed at them. Then methodically lead the more outspoken people to a calmer and more informed state of mind. The rest of the audience will mostly remain silent, but will listen intently to the proceedings. The person directing all this must use methods, diction, direction, and logic to answering their questions and help the community arrive at an informed decision.

This is not as difficult as it sounds. Aristotle used a method of asking leading questions that lead his students to a particular answer. This still is one of the best methods involving individuals or a group. Let them come up with their own answers and it will be self-fulfilling when they find "enlightenment". It helps if the person directing the questions has some understanding about the subject under discussion.

I would be willing to help in any way I can. My Ph.D. is in epistemology, the study of knowledge. There are many ways and sides to 'look' at anything. A well-informed decision is generally the calmest and surest to the conclusion of any project. My 15-year background as an engineer also gives me a lot of insight into the processes of manufacturing and some of the problems and how they can be overcome.

Please do call on me if I can be of any help. I am not a member of any organization, professional or otherwise. My conclusions and decisions are as unbiased as I can possible make them.

Sincerely

Christopher K'nerr Ph.D.
(h) 770-458-6129
cknerr@mindspring.com

October 5, 1998

Dear Chairman Howard,

A special thanks to the Hertford County Board of Commissioners and the Industrial Development Commission for laying the ground work for building the Nucor plant in Hertford County. The construction of this plant will offer good jobs and will help launch an economic recovery for Hertford County.

A visit to the Nucor Berkeley Plant in South Carolina revealed a loyal and supportive workforce and an outstanding management team.

The recovery and recycling of by-products results in a clean environment.

A demonstration outdoor recreational facility is made available to the employees and their families.

We encourage you to zone the property heavy industrial so as to accommodate this plant.

Thank you,

Richard Jackie Baker

Richard and Jackie Baker
Harrellsville, NC

GLORIA BAKER
P.O. BOX 07
HARRELLSVILLE, NC
27942

THE HONORABLE VERNICE HOWARD
1131 VIRGINIA BOULVARD
MURFREESBORO, N.C. 27855

DEAR CHAIR PERSON HOWARD;

I WRITE THIS LETTER AS A NATIVE OF HERTFORD COUNTY WHO STRONGLY SUPPORTS THE NUCOR PROJECT. I SPENT 25 YEARS AWAY FROM HERTFORD COUNTY AFTER I FINISHED NURSING SCHOOL. WHEN I MOVED BACK HOME IN 1991, I REMEMBER FEELING SADDENED BY ALL THE POVERTY AND DETERIORATION THAT WAS TO BE SEEN EVERYWHERE.

PLEASE STAND FIRMLY IN SUPPORT OF THE ECONOMIC AND CULTURAL DEVELOPMENT OF OUR COUNTY. I BELIEVE THE MAJORITY OF OUR CITIZENS FAVOR THE NUCOR PROJECT. DON'T ALLOW A FEW VOCAL RADICALS TO STOP THIS STEP FOREWARD FOR ALL OUR PEOPLE.

THANK YOU FOR SERVING OUR COUNTY IN YOUR DIFFICULT OFFICE. STAY THE PATH FOR THE FUTURE.

SINCERELY,

Gloria

GLORIA BAKER

Welcome

NUCOR

The following businesses and individuals
STRONGLY SUPPORT
NUCOR in Hertford County

United Country/Martin Realty Company
Carolyn Martin

ACE Hardware
Jamie Johnson

Action Realty Company
Henry Byrd

Ahoskie Behavioral Counseling
Linda Blackburn

Ahoskie Body Shop Inc.
Joe Spicer

Ahoskie Inn
Brownie Herbin

Aulander Furniture Company
Mary Jane Tayloe
Elaine Coburn

Belk of Ahoskie
Curtis Cluff

Barnack Mini Warehouses
Delbert Barnack

Baker, Jenkins, Jones & Daly, P.A.

Bertie Medical Complex
Steven W. Ferguson, MD
Katheryn Elizabeth Chavers

Blanchard Office Supply
Bill Blanchard

Boone Taylor Pharmacy
Carl Taylor

Bobby Beard

Tim Britton

Jim Boehm

Wendy Ruffin-Barnes

Dr. & Mrs. Jessie Croom

Stuart A. Curtis

Boyette & Robertson Insurance
David Robertson
Julian Robertson

Brown's Mobile Home Sales
Wayne Brown, Shirley Brown

Bynum R. Brown Agency
Bynum R. Brown

Commercial Ready Mix
R. A. Newsome, Jr.

Catherine's Restaurant

Chowan College

Cooke Moter Company
Ken Honeycutt

Central Ford
Jerry Stace

Centura Bank
Jerry Alexander

City Beverage
Jeff Dixon, Jimmie Dixon

Eastern Fuels
C. Wood Beasley

Elks Grand Lodge
Donald P. Wilson, Grand Exaulted Ruler

E.L.E. Inc.
Ernie Evans

First Citizens Bank

Golden Skillet

Greene Bryant Joyner
Dan Joyner

Dr. & Mrs. Chris Caswell

James Eure

Larry Joyner

Charles W. Hughes

Becky Johnson

Robert Holloman

Harrellsville Metal Works, Inc.
R. C. Kennington

H. H. Daniels Properties
Hal Daniels, Henry Daniels

High's Ice Cream
Charles Hughes

Hertford County Committee of 100

Jenkins-Brown Insurance
Johnny Jenkins

Jernigan Cleaners & Laundry
Joe Jernigan, Richard Jernigan

Johnson & McLean Co. CPA
Ben McLean, Don Johnson

Mizelle's Discount Drug Company
Louis Mizelle

M.H. Mitchell Furniture Company
Harold Mitchell

The Newsome Agency
John Newsome

North Carolina Power

Pierce Printing Company
Charles Pierce

R. L. Rowe Construction Company, Inc.
Bob Rowe

Jim Johnson

Mr. & Mrs. Dwight Kirkland

Sue Lassiter

Dr. & Mrs. Stanley G Lott

Wayne & Gertrude Myers

John Newsome

Keith Rawls Insurance
C. Keith Rawls

Roanoke Electric Cooperative
Curtis Wynn

Rent It Kwik, Inc.
Gordon Knox

Revelle Agri Products
Bill Stalls

Rose Brothers Paving
Frank Rose

Southern Delights Caterers

Sutton Tire Company
Don Bracy

Simons Farms

Stitch Count
Stan Dixon

Tomahawk Motel
Dewand Smith, Braxton Smith

Tri-Air Inc.
Henry Joyner, Betty Joyner

Craig B. Vaughan Company
Sammy Vaughan

Wachovia Bank
Scott Shook, Larry Joyner

White & Woodley Mechanical Contractors
Teddy Davis

Wal•Mart
James Cooper

Simons Farms

Scott Shook

Dr. Steve Stone

David Shields

Arthur Lee Wiggins,
Mayor, Town of Ahoskie

If you would like to join the Friends of NUCOR Campaign, please fax us at

332-5950

RESOLUTION

IN SUPPORT OF REZONING DESIGNATED PROPERTY IN HERTFORD COUNTY TO "HEAVY INDUSTRIAL" TO ACCOMODATE A NUCOR STEEL RECYCLING FACILITY

WHEREAS, The Ahoskie Chamber Of Commerce, Inc. encourages the economic development of Hertford County for the benefit of all its citizens; and

WHEREAS, Hertford County is classified among North Carolina's top twelve economically distressed counties by the North Carolina Department of Commerce; and

WHEREAS, The 1998 North Carolina General Assembly, in an overwhelmingly bi-partisan effort, created economic incentives to facilitate the location of major industries and businesses in economically distressed areas such as the Roanoke-Chowan; and

WHEREAS, Nucor Steel, the United States' second largest steel manufacturer, has chosen Hertford County as the proposed site of a $300 million steel recycling facility; and

WHEREAS, Nucor Steel successfully operates eight steel recycling facilities throughout the United States within the parameters of state and federal environmental law; and

WHEREAS, The Ahoskie Chamber Of Commerce, Inc., feels that Nucor Steel Corporation is an envioronmentally responsible company and that as a good corporate citizen they will have a positive and dynamic economic impact on Hertford County and all of northeastern North Carolina; and

WHEREAS, The Ahoskie Chamber Of Commerce, Inc., representing approximately 200 area businessess and professions, has as one of its primary roles the responsibility of promoting healthy economic development for the entire Roanoke-Chowan Area; and

WHEREAS, The Ahoskie Chamber Of Commerce, Inc., supports and welcomes Nucor Steel Corporation in their endeavor to locate their facility in Hertford County.

THEREFORE, Be It Resolved that The Ahoskie Chamber Of Commerce, Inc. Board Of Directors unanimously and enthusiastically supports the rezoning of the 900 acre site located southeast of Petty Shores on the south bank of the Chowan River to "Heavy Industrial" for the purpose of accomodating the Nucor Steel recycling facility.

The foregoing resolution of the Board Of Directors of The Ahoskie Chamber Of Commerce, Inc. was duly adopted at the regular meeting of the Board Of Directors of The Ahoskie Chamber Of Commerce, Inc. held on the 18th day of August, 1998.

Don Joyner
President

ATTEST:

Arthur L. Wiggins
Secretary To The Board
Ahoskie Chamber Of Commerce, Inc.

RESOLUTION OF SUPPORT

WHEREAS, The Edenton-Chowan Chamber of Commerce encourages the economic development of Hertford County for the benefit of all its citizens; and

WHEREAS, Hertford County is classified among North Carolina's top twelve economically distressed counties by the North Carolina Department of Commerce; and

WHEREAS, The 1998 North Carolina General Assembly, in an overwhelmingly bi-partisan effort, created economic incentives to facilitate the location of major industries and businesses in economically distressed areas such as the Roanoke-Chowan; and

WHEREAS, Nucor Steel, the United States' second largest steel manufacturer, has chosen Hertford County as the proposed site of a $300 million steel recycling facility; and

WHEREAS, Nucor Steel successfully operate eight steel recycling facilities throughout the United States within the parameters of state and federal environmental law; and

WHEREAS, The Edenton-Chowan Chamber of Commerce, Inc., feels that Nucor Steel Corporation is an environmentally responsible company and that as a good corporate citizen they will have a positive and dynamic economic impact on Hertford County and all of northeastern North Carolina; and

WHEREAS, The Edenton-Chowan Chamber of Commerce, Inc., representing approximately 260 area businesses and professions, has as one of its primary roles the responsibility of promoting healthy economic development for the entire Roanoke-Chowan Area; and

WHEREAS, The Edenton-Chowan Chamber of Commerce, Inc., supports and welcomes Nucor Steel Corporation in their endeavor to locate their facility in Hertford County.

THEREFORE, Be it resolved that the Edenton-Chowan Chamber of Commerce, Inc. Board of Directors unanimously and enthusiastically supports the site located southeast of Petty Shores on the south bank of the Chowan River for the purpose of accomodating the Nucor Steel recycling facility.

The foregoing resolution of the Board of Directors of the Edenton-Chowan Chamber of Commerce, Inc. was duly adopted at the regular meeting of the Board of Directors of the Edenton-Chowan Chamber of Commerce, Inc. held on the 10th day of September, 1998.

Jim Chesson, President

Richard Bunch, Executive Director

A RESOULUTION IN SUPPORT OF REZONING DESIGNATED PROPERTY IN HERFORD COUNTY TO "HEAVY INDUSTRIAL" TO ACCOMMODATE A NUCOR STEEL RECYCLING FACILITY

WHEREAS Hertford, Northampton, and Bertie counties are classified among North Carolina's top twelve economically distressed counties by the North Carolina Department of Commerce, and

WHEREAS The Murfreesboro Chamber of Commerce, representing 67 area businesses, takes as a primary responsibility the role of promoting healthy economic development that will benefit the town of Murfreesboro and the Roanoke-Chowan area, and

WHEREAS The 1998 North Carolina General Assembly, in an overwhelmingly bi-partisan effort, created economic incentives to facilitate the location of major industries and businesses in economically distressed areas such as the Roanoke-Chowan, and

WHEREAS Nucor Steel, the United States' second largest steel manufacturer, has chosen Hertford County as the proposed site of a $350 million steel recycling facility, and

WHEREAS Nucor Steel will employ an initial 350 workers at annual salaries averaging $60,000 per year, and

WHEREAS Nucor Steel successfully operates eight steel recycling facilities throughout the United States within the parameters of state and federal environmental law,

THEREFORE Be it resolved that the Murfreesboro Chamber of Commerce Board of Directors unanimously and enthusiastically supports the rezoning of the 900 acre site located southeast of Petty Shores on the south bank of the Chowan River to "Heavy Industrial" for the purpose of accommodating the Nucor Steel recycling facility.

Signed this 31st day of August 1998

Tommy Forbes, President

Debbie Edwards, Vice President

Libby Mooring, Secretary

Betty Francis, Treasurer

RESOLUTION OF WELCOME TO NUCOR CORPORATION BY THE HERTFORD COUNTY BOARD OF COMMISSIONERS

WHEREAS, Hertford County is in dire need of job opportunities for its citizens, and of an expanded industrial base; and,

WHEREAS, the Hertford County Board of Commissioners has actively pursued new economic development projects for many years, and has attempted to assist existing businesses and industry, in order to provide a higher standard of living for all citizens; and,

WHEREAS, Nucor Corporation has announced plans to construct a $300 million dollar mill in Hertford County, for the manufacture of plate steel, which would be the largest industrial investment ever made in Hertford County, bringing 350 high wage jobs to northeastern North Carolina; and,

WHEREAS, Nucor's proven record of commitment to its employees and to the communities in which it is located, as well as to its shareholders, represents the best attributes of American business; and,

WHEREAS, the construction and operation of the planned steel mill provides the key to open the area to additional business and industry, providing a bright future and hope for our children;

NOW, THEREFORE, The Hertford County Board of Commissionsers hereby expresses its deep appreciation to the many people who went to great efforts to secure this commitment, and hereby, on behalf of all citizens of Hertford County, extends its warmest welcome to Nucor Corporation, our newest corporate citizen.

Enacted, this the 1st day of June, 1998.

Vernice D. Howard, Chairwoman
David L. Shields, Vice-Chairman
Marshall W. Askew, Commissioner
DuPont L. Davis, Commissioner
Ray A. Farmer, Commissioner

William J. Early, Economic Development Director
Donald C. Craft, County Manager
Patricia M. Weaver, Clerk to the Board

APPENDIX L

Wetland Survey Plats

APPENDIX M

Environmental and Civic Projects

Nucor Steel

Environmental and Community Relations Efforts

Darlington, South Carolina

- Nucor teamed up with the South Carolina Waterfowl Association to increase the number of wood ducks in the state. The company donated the use of a five-acre pond and the money necessary to cover the cost of 16 nesting boxes and research involved. Since the project began in 1995, 386 ducklings have hatched.

- Nucor Darlington and Vulcraft (a Nucor division) contributed $100,000 to Florence/Darlington Technical College for capital improvements.

Berkeley County, South Carolina

- In partnership with area environmental groups, Nucor chose to convert 4,900 acres of its site into a wildlife preserve.

- The Berkeley plant also:
  - Donated land for the construction of a water tower and the right-of-way for county water lines
  - Developed the technology to recycle over 2,000 gallons of water per minute by the end of 1998
  - Built a 300-acre industrial park on its site, complete with roads and rail service, to channel future industrial development away from nearby residential areas
  - Purchased a new fire truck for the local fire department for $70,000
  - Purchased a "Jaws of Life" tool for the local rescue unit to use in saving victims of auto accidents
  - Constructed a facility for the local Emergency Response unit
  - Donated $500,000 to the Cypress Gardens nature preserve for a butterfly aviary and strollways
  - Supported the United Way with over $100,000 of donations in 1997.

St. Joe, Indiana

- The Indiana plant manufactures and paints steel joists. Most of these sites use solvent-based paints, which contribute to emissions levels. To lower the amount of its emissions, the St. Joe plant voluntarily switched to using only water-based paints, an expense of almost $4 million. The St. Joe plant's emissions dropped to a level that qualified it for a "title 5 air permit," the strictest qualification in the state.

Jewett, Texas

- A tremendous need existed in Jewett, Texas for a public park complete with its own pavilion, picnic shelters, tennis courts and jogging trails. Nucor purchased the property for the park, donated all the steel necessary for construction, and donated the labor of some of its employees. Nucor's total donation for the project has been estimated at $1.0 to $1.5 million. The local Chamber of Commerce named Nucor the "Business of the Year" for its many community relations activities.