



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 17, 2006

US Army Corps of Engineers
Regulatory Branch
PO Box 1890
Wilmington, NC 28402

ATTENTION: Mr. Richard Spencer
NCDOT Coordinator

Dear Sir:

Subject: **Revised Nationwide 33 Permit Application** for the for the replacement of Bridge No. 81 over Gum Log Creek on SR 1728, Cumberland County. Federal Aid Project No. BRZ-1728(1), State Project No. 8.2443501, Division 6, TIP Project No. B-4093, WBS Element 33451.1.1.

Reference: Original Permit Application Submitted on May 9, 2005

The N.C. Department of Transportation originally submitted a permit application for this project on May 9, 2005. The US Army Corps of Engineers requested an offsite detour. This change has been made and is included in this revised application. Please find enclosed a copy of the Categorical Exclusion (CE), CE Addendum, Pre-construction Notification (PCN), permit drawings, and ½ size plans for the above referenced project. The document states that Bridge No. 81 over Gum Log Creek will be replaced with a new 125-foot long 33-foot wide structure on the same location. Traffic will use an offsite detour during construction. No permanent impacts will occur. Proposed temporary impacts to Gum Log Creek consist of 0.02 acre of temporary fill due to the construction of a temporary work causeway. The temporary work causeway will be required to remove the existing pier in the stream. After construction is completed, the temporary work causeway will be removed. The temporary fill will be removed to the natural grade and the area will be re-vegetated with appropriate plant species.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: The project is located in the Cape Fear River basin (HUC 03030004). The project will temporarily impact Gum Log Creek. Gum Log Creek is has been assigned a best usage classification of C, by the N.C. Division of Water Quality. Gum Long Creek is not designated as a North Carolina Natural or Scenic River, or as a national Wild and Scenic River, nor is it listed as a 303(d) stream. No designated Outstanding Resource Waters (ORW), High

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-715-1334
FAX: 919-715-5501

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
2728 CAPITOL BOULEVARD
PARKER LINCOLN BUILDING, SUITE 240
RALEIGH NC 27699

Quality Waters (HQW), Water Supply I (WS-I), or Water Supply II (WS-II) waters occur within 3.0 miles of the project study area.

Temporary Impacts: Proposed temporary impacts to Gum Log Creek will total 0.02 acre of temporary fill.

Permanent Impacts: No permanent impacts will occur. No wetlands occur in the project area.

Utility Impacts: No impacts will occur due to utility relocations.

BRIDGE DEMOLITION:

Bridge No. 81 is composed of a reinforced concrete floor on timber joists on creosote timber piles encased in concrete. Bridge components are slated to be removed without dropping any components into Gum Log Creek. However, due to the presence of reinforced concrete in the superstructure of the bridge and piles, the potential exists for approximately 70 cubic yards of temporary fill requiring excavation from Gum Log Creek as a result of demolition activities. Best Management Practices’s for Bridge Demolition and Removal will be followed in addition to Best Management Practices for the Protection of Surface Waters.

FEDERALLY-PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of March 8, 2006 the Fish and Wildlife Service (FWS) lists seven federally protected species for Cumberland County (Table 1). A survey for Michaux’s sumac was conducted on September 16, 2004 and no specimens were found. A biological conclusion of No Effect has been reached for all federally protected species.

Table 1. Federally-Protected Species for Cumberland County

Common Name	Scientific Name	Federal Status	Habitat Analysis	Biological Conclusion
American alligator	<i>Alligator mississippiensis</i>	T(S/A)	No	N/A
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	No	No Effect
Saint Francis’ satyr	<i>Neonympha mitchellii francisci</i>	E	No	No Effect
Pondberry	<i>Lindera melissifolia</i>	E	No	No Effect
Rough-leaved loostrife	<i>Lysimachia asperulaefolia</i>	E	No	No Effect
Michaux’s sumac	<i>Rhus michauxii</i>	E	Yes	No Effect
American chaffseed	<i>Schwalbea americana</i>	E	No	No Effect

E-Endangered, T-Threatened

AVOIDANCE AND MINIMIZATION:

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the

planning and NEPA compliance stages; minimization measures were incorporated as part of the project design and include:

- Best Management Practices for the Protection of Surface Waters and Bridge Demolition and Removal will be followed.
- No bents will be placed in the water.
- An offsite detour will be used during construction.
- Replace at existing location.

MITIGATION

Proposed project impacts are temporary, therefore no mitigation is proposed.

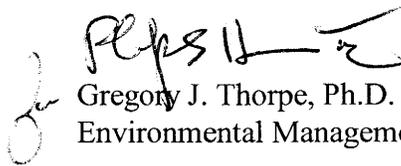
REGULATORY APPROVALS

Section 404 Permit: This project has been processed by the Federal Highway Administration as a “Categorical Exclusion” in accordance with 23 CFR 771.115(b). The NCDOT requests issuance of a Nationwide Permit 33 to authorize the impacts described above.

Section 401 Permit: We anticipate 401 General Certification number 3366 will apply to this project. All general conditions of the Water quality Certifications will be met. No written concurrence is required. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing two copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their notification.

If you have any questions or need additional information, please contact Brett Feulner at (919) 715-1488.

Sincerely,



Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA

w/attachment

- Mr. John Hennessy, NCDWQ (2 copies)
- Mr. Travis Wilson, NCWRC
- Mr. Gary Jordan, USFWS
- Mr. Michael Street, NCDMF
- Dr. David Chang, P.E., Hydraulics
- Mr. Greg Perfetti, P.E., Structure Design
- Mr. Mark Staley, Roadside Environmental
- Mr. Terry Gibson, P.E. Division 6 Engineer
- Mr. Jim Rerko, Division 6 Environmental Officer

w/o attachment

- Mr. Jay Bennett, P.E., Roadway Design
- Mr. Majed Alghandour, Programming and TIP
- Mr. Art McMillan, P.E., Highway Design
- Mr. Scott McLendon, USACE, Wilmington
- Mr. Mike Penney, PDEA Project Planning Engineer

Office Use Only:

Form Version March 05

USACE Action ID No. _____

DWQ No. _____

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

I. Processing

1. Check all of the approval(s) requested for this project:

Section 404 Permit

Riparian or Watershed Buffer Rules

Section 10 Permit

Isolated Wetland Permit from DWQ

401 Water Quality Certification

Express 401 Water Quality Certification

2. Nationwide, Regional or General Permit Number(s) Requested: NW 33

3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here:

4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here:

5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here:

II. Applicant Information

1. Owner/Applicant Information

Name: Gregory J. Thorpe, Ph.D., Environmental Management Director

Mailing Address: 1598 Mail Service Center

Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794

E-mail Address: gthorpe@dot.state.nc.us

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)

Name: _____

Company Affiliation: _____

Mailing Address: _____

Telephone Number: _____ Fax Number: _____

E-mail Address: _____

III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: Replacement of Bridge No. 81 over Gum Log Creek
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4093
3. Property Identification Number (Tax PIN): N/A
4. Location
County: Cumberland Nearest Town: Fayetteville
Subdivision name (include phase/lot number): N/A
Directions to site (include road numbers/names, landmarks, etc.): The site is located at the intersection of Middle Road and Gum Log Creek on the east side of Fayetteville
5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
Decimal Degrees (6 digits minimum): 34.4432 °N 77.8339 °W
6. Property size (acres): N/A
7. Name of nearest receiving body of water: Gum Log Creek
8. River Basin: Cape Fear
(Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at <http://h2o.enr.state.nc.us/admin/maps/>.)
9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Residential, small buisnesses, and forestland

10. Describe the overall project in detail, including the type of equipment to be used: _____
Standard DOT construction equipment.

11. Explain the purpose of the proposed work: The purpose is to replace the old bridge that is functionally obsolete.

IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. N/A _____

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.

N/A _____

VI. Proposed Impacts to Waters of the United States/Waters of the State

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts: _____ The project impacts are as follows, 0.02 acre of temporary fill in Gum Log Creek

2. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
Total Wetland Impact (acres)					

3. List the total acreage (estimated) of all existing wetlands on the property: 0

4. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width, then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 1	Gum Log Creek	Temporary	Perennial	25	53	0.02
Total Stream Impact (by length and acreage)					53	0.02

5. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
Total Open Water Impact (acres)				

6. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	0.02
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.02
Total Stream Impact (linear feet):	0

7. Isolated Waters

Do any isolated waters exist on the property? Yes No

Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

8. Pond Creation

If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.

Pond to be created in (check all that apply): uplands stream wetlands

Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.):

Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.):

Current land use in the vicinity of the pond:

Size of watershed draining to pond: _____ Expected pond surface area: _____

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. Best management Practices for the protection of Surface Waters and BMP's for Bridge demolition and removal

VIII. Mitigation

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland

and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina, available at <http://h2o.enr.state.nc.us/ncwetlands/strmgide.html>.

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.

No mitigation is proposed due to proposed impacts are temporary

2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at <http://h2o.enr.state.nc.us/wrp/index.htm>. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

Amount of stream mitigation requested (linear feet): _____

Amount of buffer mitigation requested (square feet): _____

Amount of Riparian wetland mitigation requested (acres): _____

Amount of Non-riparian wetland mitigation requested (acres): _____

Amount of Coastal wetland mitigation requested (acres): _____

IX. Environmental Documentation (required by DWQ)

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes No
2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)? Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation. Yes No

3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes No

X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify _____)? Yes No
2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1		3 (2 for Catawba)	
2		1.5	
Total			

* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260. _____

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. Approximately the same as current conditions

XII. Sewage Disposal (required by DWQ)

Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility.

N/A

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?

Yes No

Is this an after-the-fact permit application? Yes No

XIV. Cumulative Impacts (required by DWQ)

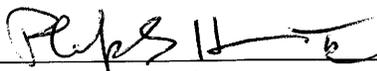
Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes No

If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at <http://h2o.enr.state.nc.us/ncwetlands>. If no, please provide a short narrative description: _____

Replace an existing structure

XV. Other Circumstances (Optional):

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).



Applicant/Agent's Signature

4/17/06

Date

(Agent's signature is valid only if an authorization letter from the applicant is provided.)

09/08/09

TIP: B-4093

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

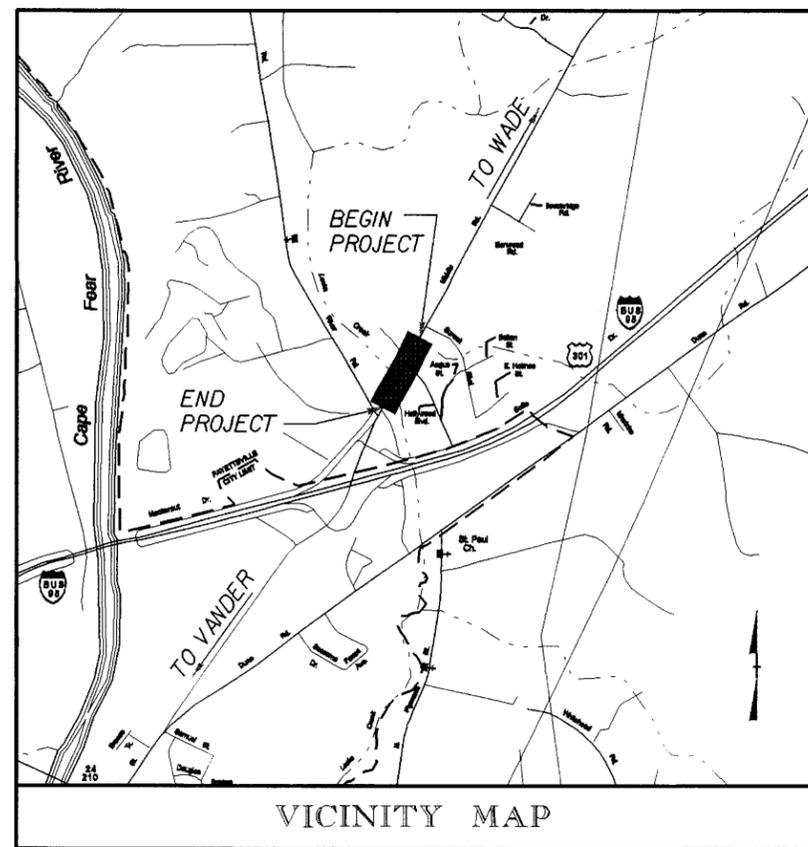
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

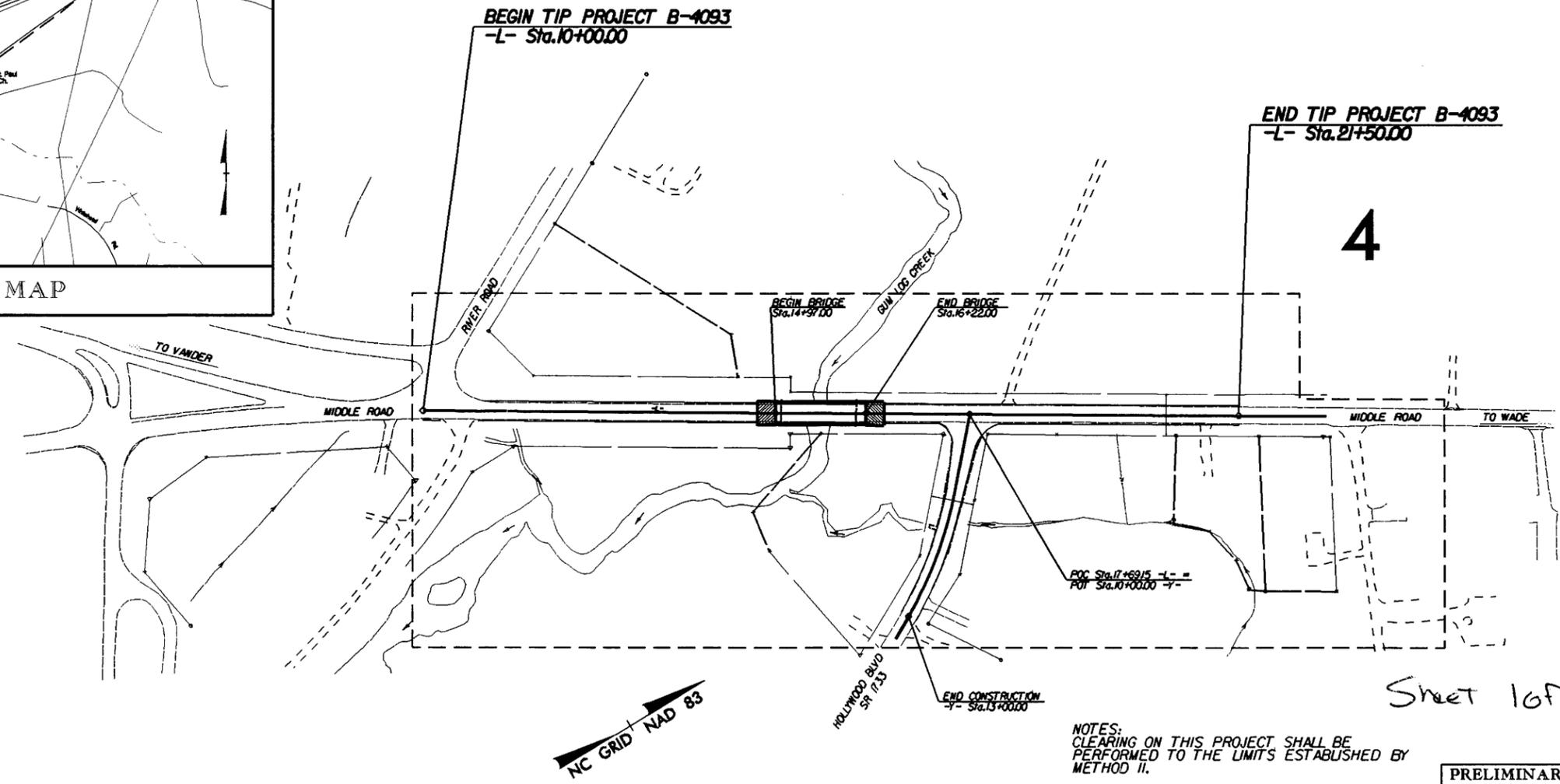
LOCATION: BRIDGE NO. 81 OVER GUM LOG CREEK ON SR 1728 (MIDDLE RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4093	1	
WM NO.	F.A. PROJ. NO.	DESCRIPTION	
33451.1.1	BRZ-1728(1)	P.E.	



VICINITY MAP



4

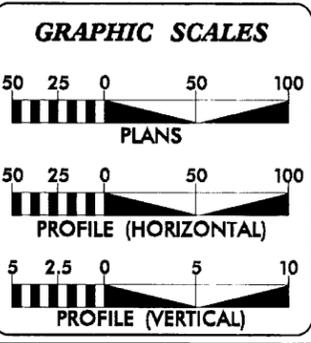
Sheet 1 of 4

NOTES:
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

THIS PROJECT IS NOT LOCATED WITHIN THE BOUNDARIES OF ANY MUNICIPALITY.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NCDOT CONTACT: TERESA BRUTON, P.E. - PROJECT ENGINEER - PROJECT SERVICES



DESIGN DATA

ADT 2005 =	3,250
ADT 2025 =	5,400
DHV =	10 %
D =	60 %
T =	5 % *
V =	60 MPH
* TTST 2%	DUAL 3%
FUNCTIONAL CLASS.	URBAN COLL.

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4093 =	0.194 MILES
LENGTH OF STRUCTURE TIP PROJECT B-4093 =	0.024 MILES
TOTAL LENGTH OF TIP PROJECT B-4093 =	0.218 MILES

Prepared in the Office of:
WILBUR SMITH ASSOCIATES
P.O. BOX 2478 RALEIGH, NC 27602-2478 PHONE (919) 755-0583

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 2004

LETTING DATE:
APRIL 19, 2005

DAVID L. WILVER, P.E.
PROJECT ENGINEER

DAVID L. WILVER, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR

DATE

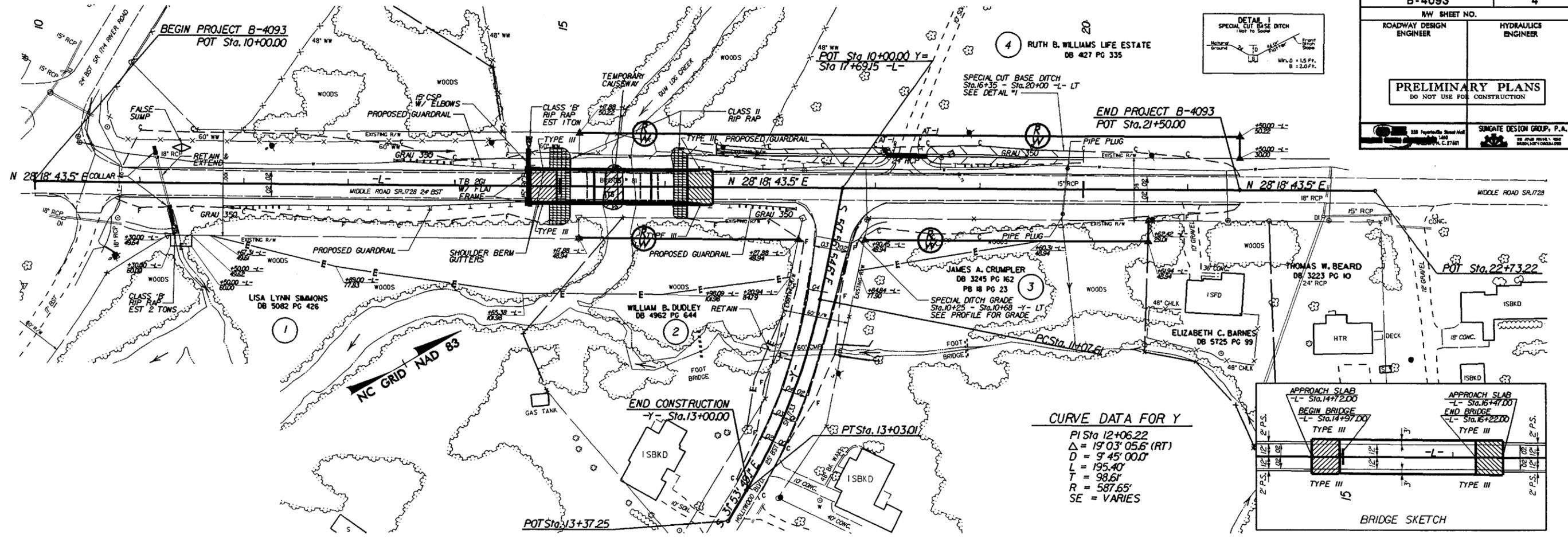
CONTRACT:

DATE SAVED
NAME
FIRM

B.17/99

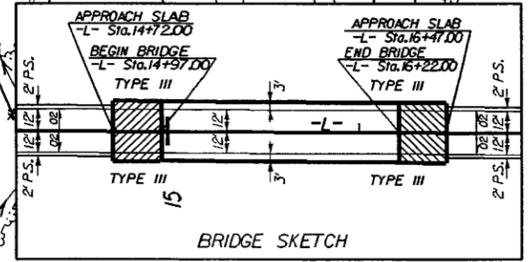
ENGLISH

PROJECT REFERENCE NO. B-4093	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
SINGATE DESIGN GROUP, P.A. 238 Poplarville Street, Suite 100 Poplarville, MS 39450 Phone: 601-792-1100 Fax: 601-792-1101	

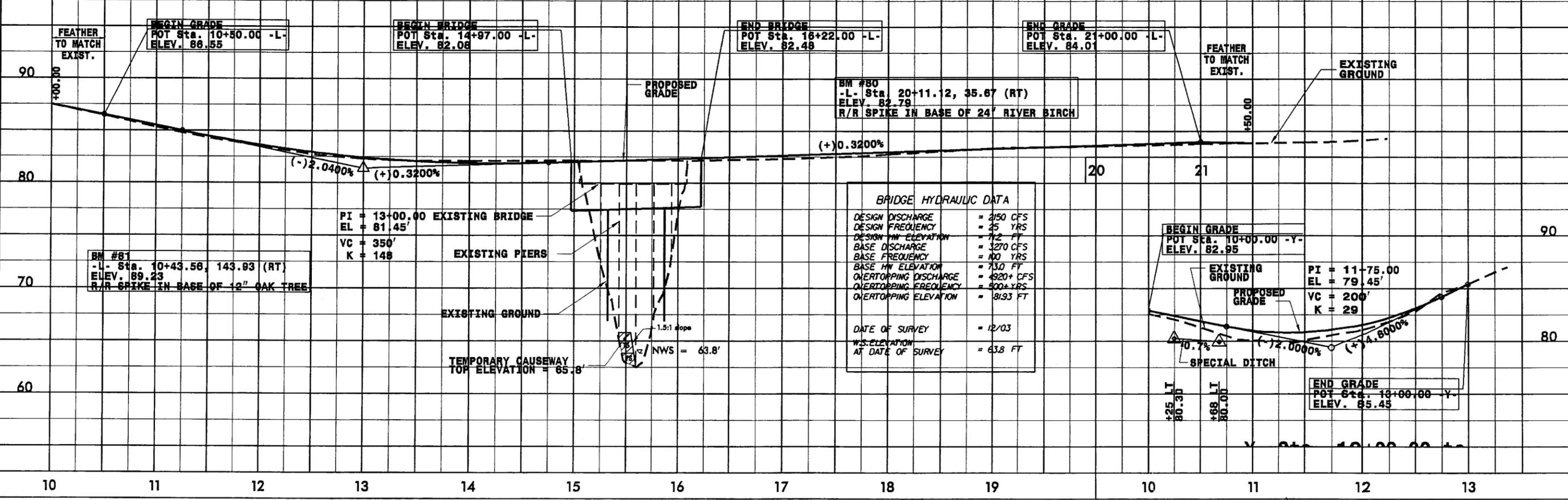


CURVE DATA FOR Y

PI Sta	12+06.22
Δ =	19° 03' 05.6" (RT)
D =	9' 45" 00.0"
L =	195.40'
T =	98.61'
R =	587.65'
SE =	VARIABLES



-L- Sta. 10+00.00 to Sta. 21+50.00



BM #81
-L- Sta. 10+43.58, 143.93 (RT)
ELEV. 89.23
R/R SPIKE IN BASE OF 12" OAK TREE

PI = 13+00.00 EXISTING BRIDGE
EL = 81.45'
VC = 350'
K = 148

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2150 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 74.2 FT
BASE DISCHARGE	= 3270 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 73.0 FT
OVERTOPPING DISCHARGE	= 4920+ CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 81.93 FT
DATE OF SURVEY	= 12/03
W.S. ELEVATION AT DATE OF SURVEY	= 63.8 FT

BEGIN GRADE
POT Sta. 10+00.00 -Y-
ELEV. 82.95

EXISTING GROUND

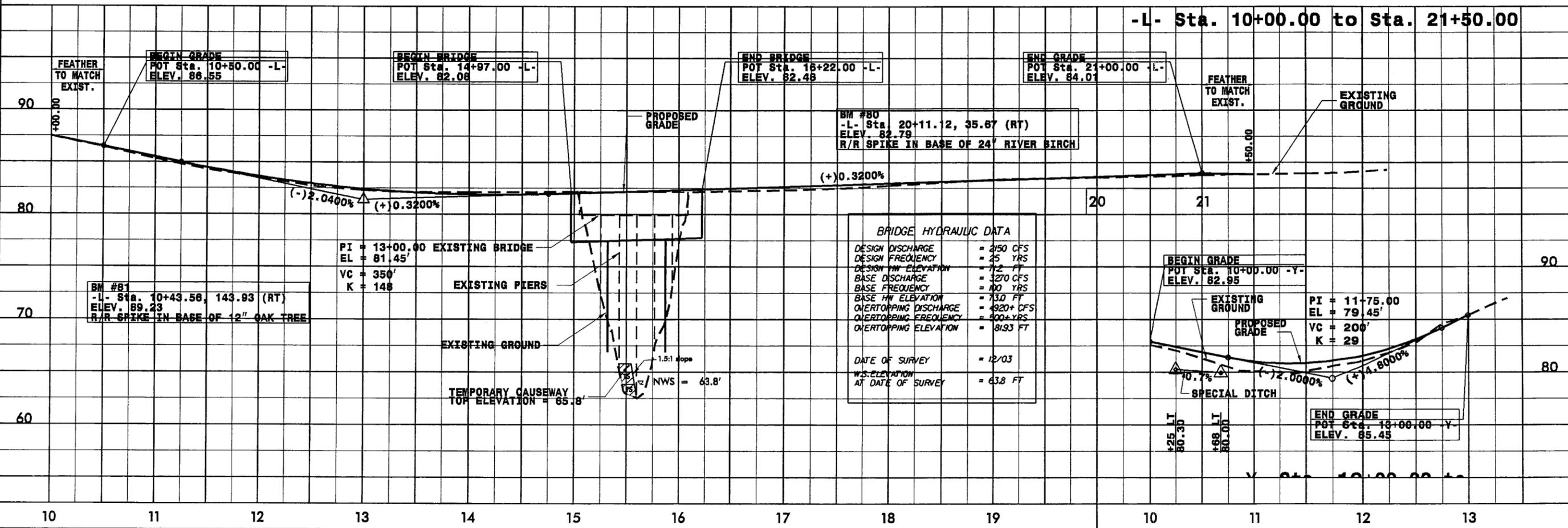
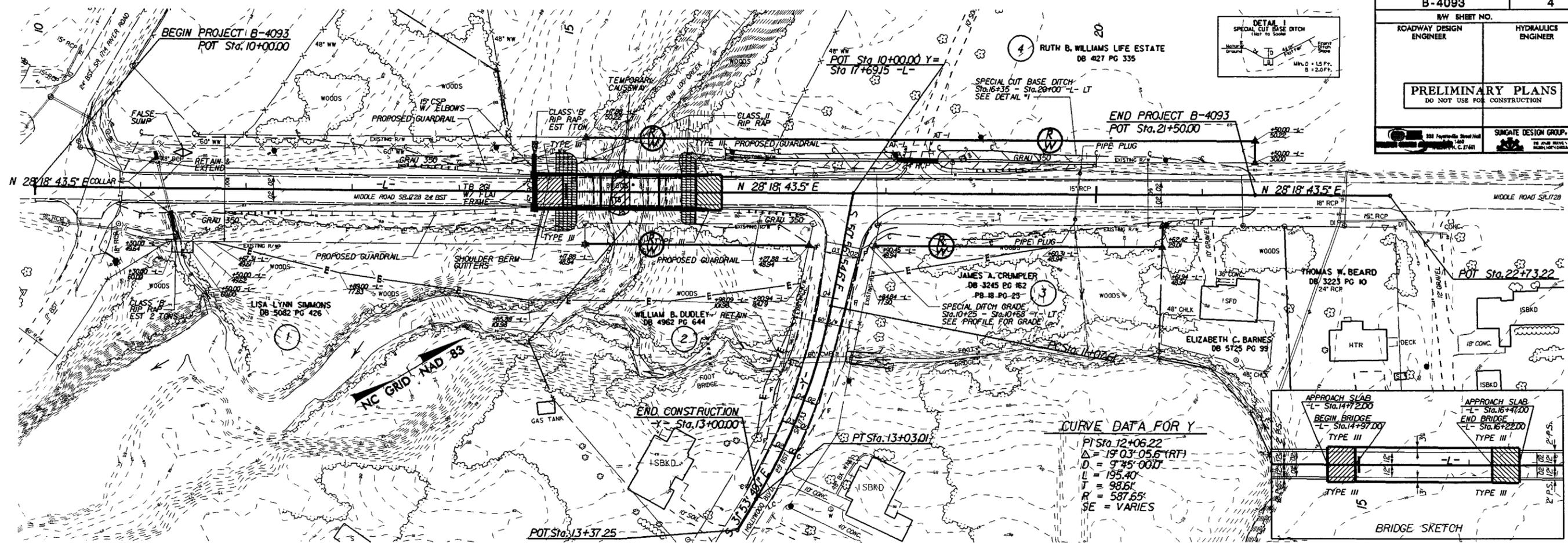
PROPOSED GRADE

PI = 11+75.00
EL = 79.45'
VC = 200'
K = 29

END GRADE
POT Sta. 16+00.00 -Y-
ELEV. 85.45

DATE: 12/03
DRAWN: STANLEY
CHECKED: STANLEY

permit drawing (Chambers)



permit drawing Lho + 7 64

REVISIONS

DATE, DATE, TIME, STATION, FILES

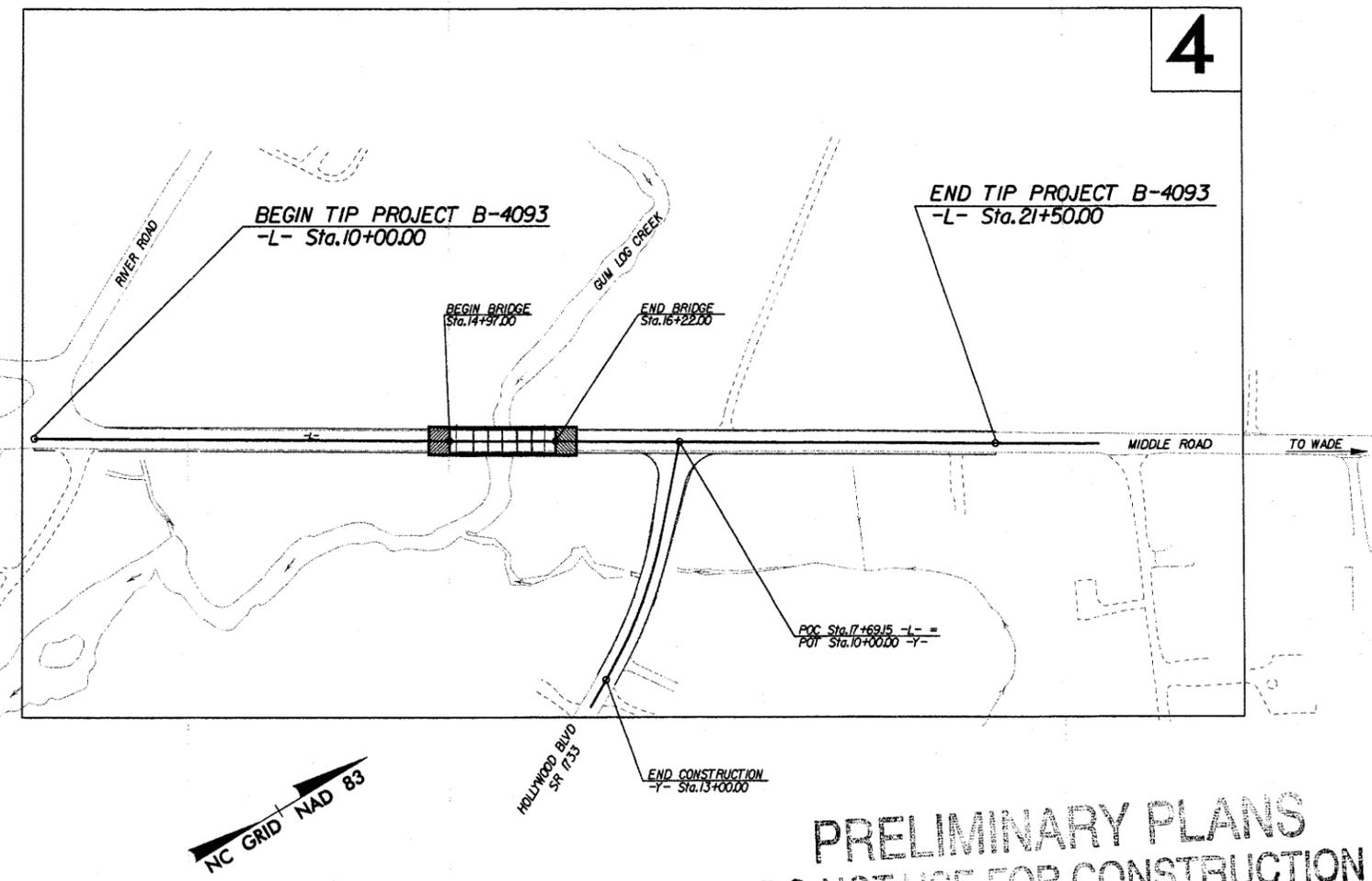
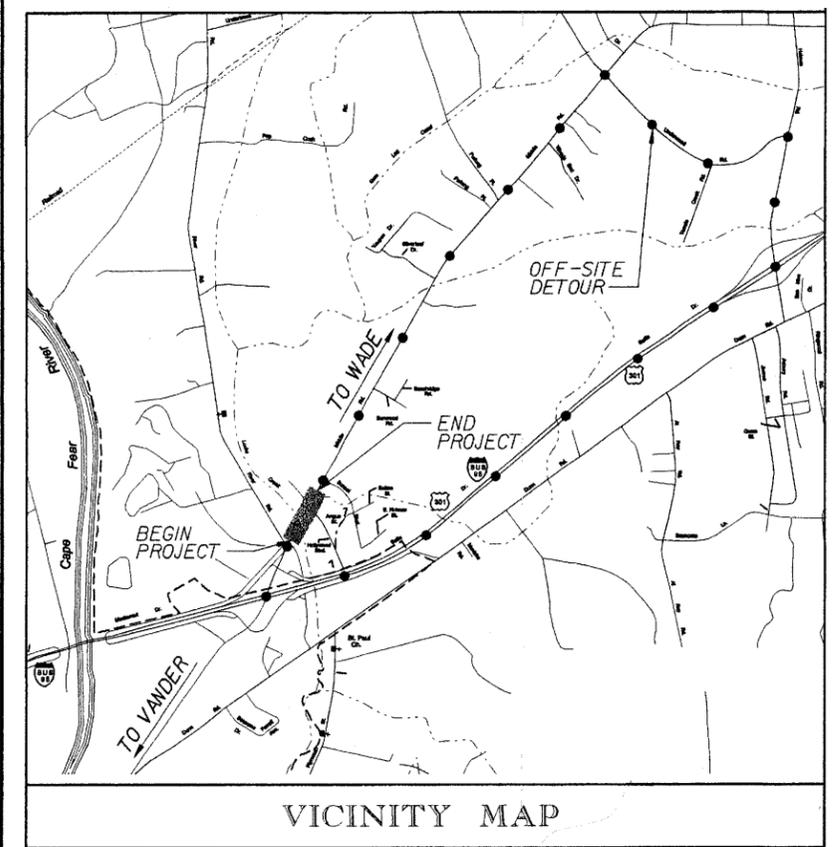
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4093	1	
WM NO.	F.A. PROJ. NO.	DESCRIPTION	
33451.1.1	BRZ-1728(1)	P.E.	
33451.2.1	BRZ-1728(1)	RW & UTILITIES	
33451.3.1	BRZ-1728(3)	CONST.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

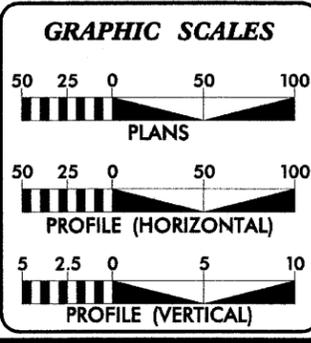
LOCATION: BRIDGE NO. 81 OVER GUM LOG CREEK ON SR 1728 (MIDDLE RD.)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



CONTRACT: C201257 TIP: PROJECT B-4093

NCDOT CONTACT: B.D.TAYLOR, P.E. - PROJECT ENGINEER - ROADWAY DESIGN



DESIGN DATA

ADT 2005 =	3,250
ADT 2025 =	5,400
DHV =	10 %
D =	60 %
T =	5 % *
V =	60 MPH
* TTST 2%	DUAL 3%
FUNCTIONAL CLASS.	URBAN COLL.

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4093 =	0.194 MILES
LENGTH OF STRUCTURE TIP PROJECT B-4093 =	0.024 MILES
TOTAL LENGTH OF TIP PROJECT B-4093 =	0.218 MILES

Prepared in the Office of:
WILBUR SMITH ASSOCIATES
P.O. BOX 2478 RALEIGH, NC 27602-2478 PHONE (919) 755-0583

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 30, 2004

LETTING DATE:

DAVID L. WILVER, P.E.
PROJECT ENGINEER

DAVID L. WILVER, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

SIGNATURE: _____

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR

DATE

**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

DATE: 12/6/05 TIME: 12:00:14 PM r:\w\ad\l\c-4093\roadway\proj\c201257_tip_01.dgn

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

*S.U.E = SUBSURFACE UTILITY ENGINEER

CONVENTIONAL SYMBOLS

ROADS & RELATED ITEMS

Edge of Pavement	-----
Curb	-----
Prop. Slope Stakes Cut	----- C -----
Prop. Slope Stakes Fill	----- F -----
Prop. Woven Wire Fence	○-----○
Prop. Chain Link Fence	□-----□
Prop. Barbed Wire Fence	◇-----◇
Prop. Wheelchair Ramp	WCR
Curb Cut for Future Wheelchair Ramp	CCFR
Exist. Guardrail	-----
Prop. Guardrail	-----
Equality Symbol	⊕
Pavement Removal	XXXXXX

RIGHT OF WAY

Baseline Control Point	◆
Existing Right of Way Marker	△
Exist. Right of Way Line w/Marker	-----△-----
Prop. Right of Way Line with Proposed	-----▲-----
R/W Marker (Iron Pin & Cap)	▲
Prop. Right of Way Line with Proposed	-----▲-----
(Concrete or Granite) R/W Marker	▲
Exist. Control of Access Line	⊙
Prop. Control of Access Line	⊙
Exist. Easement Line	-----E-----
Prop. Temp. Construction Easement Line	-----E-----
Prop. Temp. Drainage Easement Line	-----TDE-----
Prop. Perm. Drainage Easement Line	-----PDE-----

HYDROLOGY

Stream or Body of Water	-----
River Basin Buffer	-----RBB-----
Flow Arrow	→
Disappearing Stream	-----
Spring	⊕
Swamp Marsh	⊕
Shoreline	-----
Falls, Rapids	-----
Prop Lateral, Tail, Head Ditches	-----

STRUCTURES

MAJOR	
Bridge, Tunnel, or Box Culvert	-----CONC-----
Bridge Wing Wall, Head Wall and End Wall	-----CONC WW-----

MINOR

Head & End Wall	-----CONC HW-----
Pipe Culvert	-----
Footbridge	-----
Drainage Boxes	□ CB
Paved Ditch Gutter	-----

UTILITIES

Exist. Pole	•
Exist. Power Pole	•
Prop. Power Pole	•
Exist. Telephone Pole	•
Prop. Telephone Pole	•
Exist. Joint Use Pole	•
Prop. Joint Use Pole	•
Telephone Pedestal	⊕
U/G Telephone Cable Hand Hold	⊕
Cable TV Pedestal	⊕
U/G TV Cable Hand Hold	⊕
U/G Power Cable Hand Hold	⊕
Hydrant	⊕
Satellite Dish	⊕
Exist. Water Valve	⊕
Sewer Clean Out	⊕
Power Manhole	⊕
Telephone Booth	⊕
Cellular Telephone Tower	⊕
Water Manhole	⊕
Light Pole	⊕
H-Frame Pole	⊕
Power Line Tower	⊕
Pole with Base	⊕
Gas Valve	⊕
Gas Meter	⊕
Telephone Manhole	⊕
Power Transformer	⊕
Sanitary Sewer Manhole	⊕
Storm Sewer Manhole	⊕
Tank; Water, Gas, Oil	⊕
Water Tank With Legs	⊕
Traffic Signal Junction Box	⊕
Fiber Optic Splice Box	⊕
Television or Radio Tower	⊕
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement	-----TS-----

Recorded Water Line	-----W-----
Designated Water Line (S.U.E.*)	-----W-----
Sanitary Sewer	-----SS-----
Recorded Sanitary Sewer Force Main	-----FSS-----
Designated Sanitary Sewer Force Main(S.U.E.*)	-----FSS-----
Recorded Gas Line	-----G-----
Designated Gas Line (S.U.E.*)	-----G-----
Storm Sewer	-----S-----
Recorded Power Line	-----P-----
Designated Power Line (S.U.E.*)	-----P-----
Recorded Telephone Cable	-----T-----
Designated Telephone Cable (S.U.E.*)	-----T-----
Recorded U/G Telephone Conduit	-----TC-----
Designated U/G Telephone Conduit (S.U.E.*)	-----TC-----
Unknown Utility (S.U.E.*)	-----UTL-----
Recorded Television Cable	-----TV-----
Designated Television Cable (S.U.E.*)	-----TV-----
Recorded Fiber Optics Cable	-----FO-----
Designated Fiber Optics Cable (S.U.E.*)	-----FO-----
Exist. Water Meter	⊕
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to U/G Record	AATUR
End of Information	E.O.I.

BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	⊕
Exist. Iron Pin	⊕
Property Corner	⊕
Property Monument	⊕
Property Number	⊕
Parcel Number	⊕
Fence Line	-----X-----
Existing Wetland Boundaries	-----WLB-----
High Quality Wetland Boundary	-----HQ WLB-----
Medium Quality Wetland Boundaries	-----MQ WLB-----
Low Quality Wetland Boundaries	-----LQ WLB-----
Proposed Wetland Boundaries	-----WLB-----
Existing Endangered Animal Boundaries	-----EAB-----
Existing Endangered Plant Boundaries	-----EPB-----

BUILDINGS & OTHER CULTURE

Buildings	-----
Foundations	-----
Area Outline	-----
Gate	-----
Gas Pump Vent or U/G Tank Cap	-----
Church	-----
School	-----
Park	-----
Cemetery	-----
Dam	-----
Sign	-----
Well	-----
Small Mine	-----
Swimming Pool	-----

TOPOGRAPHY

Loose Surface	-----
Hard Surface	-----
Change in Road Surface	-----
Curb	-----
Right of Way Symbol	R/W
Guard Post	⊕ GP
Paved Walk	-----
Bridge	-----
Box Culvert or Tunnel	-----
Ferry	-----
Culvert	-----
Footbridge	-----
Trail, Footpath	-----
Light House	-----

VEGETATION

Single Tree	-----
Single Shrub	-----
Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----VINEYARD-----

RAILROADS

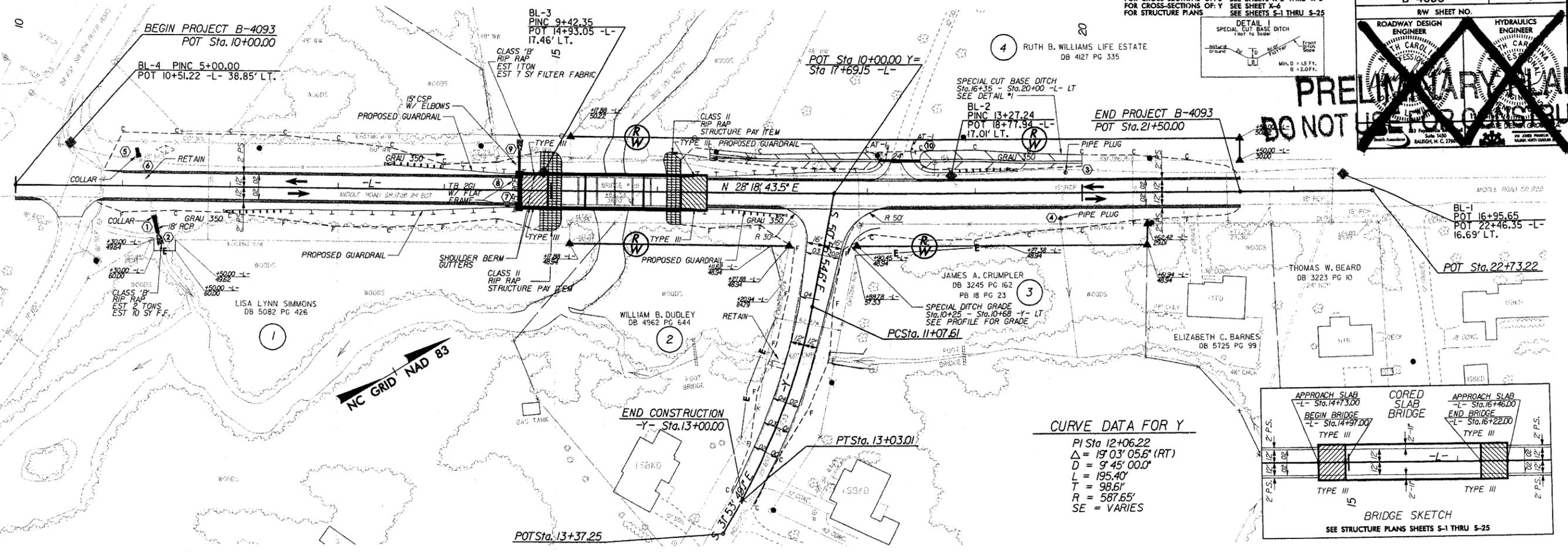
Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----

5/28/99 DATE: 12/6/2005 PM TIME: 10:00:00 FILE: C:\Users\j\Documents\4093_rby_snh_01b.dgn

NOTES
 FOR CROSS-SECTIONS OF: L SEE SHEETS X-2 THRU X-5
 FOR CROSS-SECTIONS OF: Y SEE SHEET X-6
 FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-25

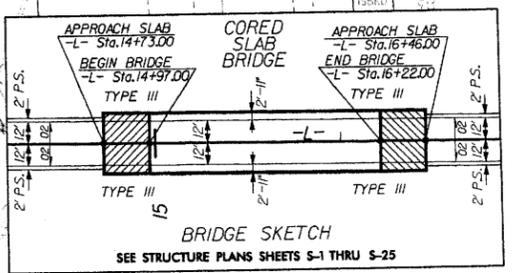
PROJECT REFERENCE NO. B-4093 SHEET NO. 4

RW SHEET NO. HYDRAULICS ENGINEER
 ROADWAY DESIGN ENGINEER
 PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION



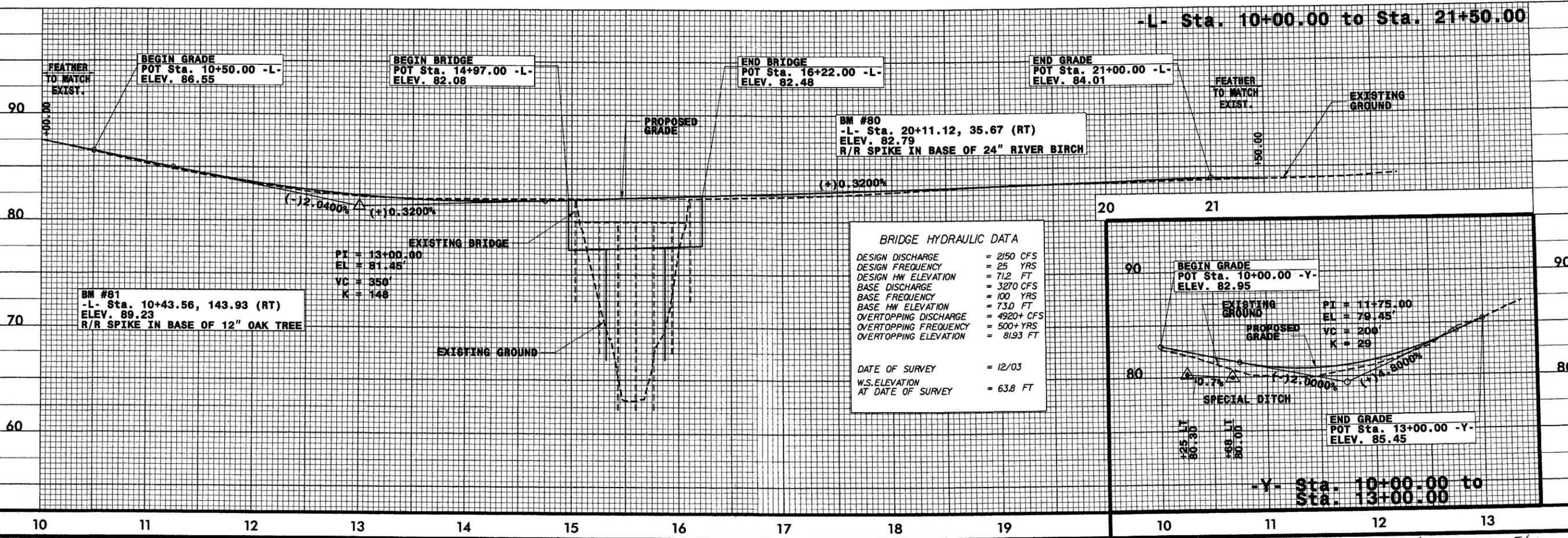
CURVE DATA FOR Y

PI Sta. 12+06.22
 $\Delta = 19^{\circ} 03' 05.6" (RT)$
 $D = 9^{\circ} 45' 00.0"$
 $L = 195.40'$
 $T = 98.61'$
 $R = 587.65'$
 $SE = VARIES$



REVISIONS
 11/30/04 R/W REVISION: ADDED PROPERTY TIES FROM LOCATION AND SURVEYS

-L- Sta. 10+00.00 to Sta. 21+50.00



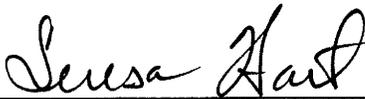
DATE: 12/26/05
 TIME: 1:23:57 PM
 P:\mason\B-4093\Roadway\Proj\bd093_RWD_pah_04.dgn

Cumberland County
SR 1728
Bridge No. 81 over Gum Log Creek
Federal-Aid Project: BRZ-1728(1)
State Project: 8.2443501
T.I.P. No. B-4093

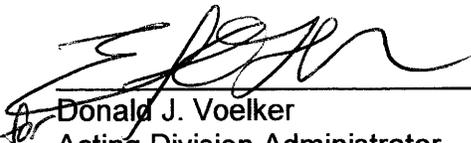
Categorical Exclusion
US Department of Transportation
Federal Highway Administration
and
NC Department of Transportation
Division of Highways

Approved

1/31/03
Date

for 
Gregory J. Thorpe, PhD, Environmental Management Director
Project Development & Environmental Analysis Branch
North Carolina Department of Transportation

1/31/03
Date


Donald J. Voelker
Acting Division Administrator,
Federal Highway Administration

Cumberland County
SR 1728
Bridge No. 81 over Gum Log Creek
Federal-Aid Project: BRZ-1728(1)
State Project: 8.2443501
T.I.P. No. B-4093

Categorical Exclusion
US Department of Transportation
Federal Highway Administration
and
NC Department of Transportation
Division of Highways

January 2003

Document Prepared by

Wilbur Smith Associates, Inc.


Iona L. Hauser
Senior Environmental Planner


David L. Wilver, P.E.
Project Manager



for the
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION


Teresa Hart, P.E., CPM
Consultant Unit Head


John M. Penney, P.E.
Project Planning Engineer

PROJECT COMMITMENTS

Cumberland County
SR 1728
Bridge No. 81 Over Gum Log Creek;
Federal Aid Project No.: BRZ-1728(1)
State Project No.: 8.2443501
TIP No.: B-4093

In addition to the standard Nationwide Permit #33 and #23 Conditions, the General Nationwide Permit Conditions, Section 404 Individual Permit (IP) Special Conditions, Section 401 Water Quality Certification (WQC) Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Commitments Developed Through Project Development and Design

All commitments developed during the project development and design phase have been incorporated into the design and were standard commitments. Current status, changes, or additions to the project commitments as shown in the environmental document for the project are printed in *italic* font.

Design Services/Roadside Environmental/Division 6 Construction

Ensure that sediment and erosion control measures are not placed in wetlands.

This standard will be implemented during construction to the best ability of the Department in coordination with existing standards and laws.

Appropriate sediment and erosion control measures will be placed on/a long the temporary detour to ensure minimal degradation of Gum Log Creek.

This environmental commitment will be addressed during design and will be implemented during construction of the project.

Design Services/ Division 6 Construction

Borrow/waste areas should avoid wetlands to the maximum extent practicable. Prior to the approval of any borrow/waste site in a wetland, the contractor must obtain all necessary permits.

This standard will be used during design and will be implemented during construction of the project.

Division 6 Construction

Disturbance of the stream channels must be limited to only what is necessary to perform the bridge demolition/removal and construction of the replacement structure and what is permitted. Heavy equipment must be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into the stream.

This environmental commitment will be implemented during construction of the project.

PROJECT COMMITMENTS

Division 6 Construction

All work shall be performed during low flow conditions

This environmental commitment will be implemented during construction of the project.

Cumberland County
SR 1728
Bridge No. 81 over Gum Log Creek
Federal-Aid Project: BRZ-1728(1)
State Project: 8.2443501
T.I.P. No. B-4093

Bridge No. 81 is included in the Draft 2004-2010 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location of this bridge is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

I. PURPOSE AND NEED

NCDOT Bridge Maintenance Unit records indicated that Bridge No. 81 has a sufficiency rating of 49 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. Replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

This project involves the replacement of Bridge No. 81 on SR 1728 over Gum Log Creek in Cumberland County (See Figure 1). Gum Log Creek is in the Cape Fear River Basin. The area of the drainage basin for the creek at the subject location is 31 square miles (80 square kilometers).

The existing Bridge No. 81 consists of six (6) spans of approximately 17 feet (5.3 meters (m)) each. Total length of the existing bridge is 104 feet (31.7 m) with a bed to crown height of 19 feet (5.7 m). Construction consists of concrete deck on timber beams and timber bents with concrete spread footings and timber abutments. There are two 11 foot travel lanes and a total of 26 feet (7.9 m) clear roadway width. The existing bridge is in a horizontal tangent and is skewed 90 degrees to the roadway. Vertical grade on the bridge is relatively flat. The grade of the north approach falls toward the bridge with the sag located on the south approach approximately 100 feet (30.5 m) from the bridge. Both approaches are in horizontal tangent with good sight distances (See Figure 3). The south approach begins to curve approximately 500 feet (152.4 m) from the bridge.

There are no utilities attached to the bridge. Overhead power and telephone line run parallel to the upstream side of the bridge, and there is a buried waterline upstream of the bridge.

According to NCDOT Bridge Maintenance floodwater has been approximately 10 feet (3.0 m) above normal water surface elevation. Attempts to corroborate this information with local residents were unsuccessful. There was no debris accumulation or scour was observed. The channel banks appear to be stable with trees and small bushes. There were no wetlands observed at the bridge. There are no structures or utilities observed in the floodplain except those mentioned above. Bridge scour information for the existing bridge is not available, as it has not been assessed due to insufficient substructure data.

The posted speed limit is 55 MPH. The 2001 average daily traffic volume is 2,800 vehicles per day (vpd). The projected traffic volume is expected to increase to 5,400 vpd by the year 2025. Currently 12 school buses (six (6) in AM and six (6) in PM) use this bridge daily.

Six accidents were reported in the vicinity of this bridge during the period from January 1, 1997 to July 31, 2000. None of the accidents resulted in personal injury, however six involved property damage.

III. ALTERNATIVES

A. Project Description

The recommended Bridge length is based on a preliminary hydraulic analysis in conjunction with a field reconnaissance of the site, the proposed replacement structure is a bridge approximately 120 feet (36.6 m) long. The grade of the roadway will be approximately the same as the existing road. A minimum grade of three tenths (0.3) of a percent should be maintained to facilitate deck drainage. The length of the proposed bridge and the recommended roadway elevation may be adjusted (increased or decreased) to accommodate design floods as determined in the final hydrologic study and hydraulic design.

B. Build Alternatives (Figure 2)

The alternative for replacing Bridge No. 81 is described below.

Alternate 1 (Preferred) includes replacement of the existing 104 foot (ft) [31.7 meter (m)] structure with a new structure in the same location as the existing structure. The proposed structure will consist of two 12 foot travel lanes and two 3 foot shoulders for a total clear roadway width of 30 feet (9.2 m). The new structure will be approximately 120 ft (36.6 m) in length and 33 ft (10.1 m) wide. The approach work will extend from approximately 270 ft (82 m) north to approximately 270 ft (82 m) south of the existing structure. Traffic will be maintained with a temporary on-site detour located approximately 10 ft (3 m) east of the existing structure. Approach work for the temporary detour will extend from approximately 480 ft (146 m) north to 460 ft (140 m) south of the temporary pipe culvert structure utilizing

three (3) 84 inch corrugated steel pipe. The total project length including the temporary detour is approximately 1050 ft (320 m).

C. Alternatives Eliminated From Further Study

Alternate 2 includes replacement of the existing approximately 104 ft (31.7 m) two lane bridge with a new two lane structure approximately 20 ft (6 m) upstream of the existing structure. The new structure will be approximately 120 ft (36 m) in length. The approach work will extend from approximately 820 ft (250 m) north to approximately 900 ft (274 m) south of the existing structure. The total project length is approximately 1840 ft (560 m) in length. Traffic will be maintained on the existing structure during construction.

No Action Alternate The “do-nothing” alternative would eventually necessitate removal of the bridge effectively removing the westbound section of HWY 74 from traffic service. Investigation of the existing structure by the Bridge Maintenance Unit indicates the rehabilitation of the old bridge is not feasible due to its age and deteriorated condition.

D. Preferred Alternative

Alternate 1 is the preferred alternate. It proposes to replacement of the existing 104 foot (ft) [31.7 meter (m)] structure with a new structure in the same location as the existing structure. Alternate 1 was selected because of fewer impacts to streams, better horizontal alignment, and lower construction costs. NCDOT Division 6 Engineer concurs with the preferred alternative and on site detour.

IV. ESTIMATED COST

Table 1: Estimated Cost

	Alternate 1 (Preferred)	Alternate 2
Structure Removal (Existing)	\$18,880	\$18,880
Structure (Proposed)	\$270,000	\$270,000
Detour and Approaches	\$41,850	\$0
Roadway Approaches	\$440,100	\$509,700
Miscellaneous and Mobilization	\$261,170	\$272,720
Engineering and Contingencies	\$168,000	\$178,700
ROW/Const. Easement/Utilities	\$58,000	\$59,875
Total	\$1,258,000	\$1,309,875

V. NATURAL RESOURCES

A. Methodology

The purpose of this study is to provide an evaluation of natural resources in the project study area. Specifically, the tasks performed for this study include: 1) a delineation of jurisdictional wetlands and/or surface waters and preparation of a map depicting the jurisdictional areas based on Global Positioning System (GPS) data; 2) an assessment of natural resource features within the project study area including descriptions of vegetation, wildlife, protected species, streams, wetlands, and water quality; 3) an evaluation of probable impacts resulting from construction and alternatives; and 4) a preliminary determination of permit needs.

The project study area is located on SR 1728 over Gum Log Canal, in Cumberland County, North Carolina (Figure 1). The bridge is located approximately one tenth (0.1) of a mile (0.2 km) northeast of the intersection SR 1714 and SR 1728. The project study area comprises an area approximately 2000 ft (610 m) in length and approximately 400 ft (122 m) in width. The project study area is rural in nature and consists of a mixture of forested areas and agricultural land

Materials and research data in support of this investigation have been derived from a number of sources including applicable United States Geological Survey (USGS) 7.5-minute quadrangle topographic mapping [Polkton, NC (USGS 1970) and Russellville, NC (USGS 1971)], U.S. Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI) mapping, the *Soil Survey of Anson County, North Carolina* (United States Department of Agriculture 2000) as prepared by the Natural Resources Conservation Service (NRCS), and recent aerial photography (scale 1:2400) furnished by Wilbur Smith Associates.

Aerial photography served as the basis for mapping plant communities and wetlands. Plant community patterns were identified from available mapping sources and then field verified. Plant community descriptions were based on a classification system utilized by North Carolina Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names generally follow nomenclature found in Radford *et al.* (1968).

Jurisdictional wetlands were identified using the three parameter approach (hydrophytic vegetation, hydric soils, wetland hydrology) following U.S. Army Corps of Engineers (COE) delineation guidelines (DOA 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979). Jurisdictional surface waters (*i.e.*, streams) were delineated pursuant to current COE and North Carolina Division of Water Quality (DWQ) protocol. All jurisdictional areas were located using Trimble™ GPS

units and the collected data were differentially corrected and plotted to produce working maps and site plans.

Water quality information for area streams and tributaries was obtained from the *Yadkin-Pee Dee Basinwide Water Quality Management Plan* (DWQ 1998), and the North Carolina Department of Environment and Natural Resources (DENR). Quantitative sampling was not undertaken to support existing data. Benthic macroinvertebrates were collected using current DWQ protocol. Fish populations were sampled using seine and dip nets. Fisheries sampling is conducted by Environmental Services, Inc. (ESI) under North Carolina Wildlife Resources Commission (NCWRC) Permit # 0616.

Additional resources utilized for this natural systems investigation include the most recent list (March 7, 2002) of federally Threatened and Endangered species by county published by FWS. Records kept by the North Carolina Natural Heritage Program (NHP) were also reviewed on June 4, 2001 and periodically updated to determine if there are any documented cases of listed species occurring within three (3) miles (mi) [4.8 kilometers (km)] of the project study area (most recent update February 25, 2002). Habitat used by terrestrial wildlife and aquatic organisms, as well as expected population distributions, were determined through field observations, evaluation of available habitat, and supportive documentation (Martof *et al.* 1980, Webster *et al.* 1985, Menhinick 1991, Hamel 1992, Rohde *et al.* 1994, Palmer and Braswell 1995).

B. Physiography and Soils

The project study area is located in the Coastal Plain physiographic province. The topography in the project study area is generally characterized as nearly level to gently sloping. Elevations in the project study area range from 75 to 90 ft (23 to 27 m) above mean sea level (USGS 1997).

The project study area crosses three soil mapping units (USDA 1984). Non-hydric soil mapping units present within the project study area include the Altavista fine sandy loam (*Aquic Hapludults*) and Wickham fine sandy loam (*Typic Hapludults*). Wickham fine sandy loam is non-hydric but may contain hydric inclusions of Roanoke soils (*Typic Ochraqults*) that are found in depressions. The hydric soil mapping unit in the project study area is mapped as the Roanoke and Wahee loam (*Typic Ochraqults*) that are poorly drained soils.

C. Water Resources

1. Water Impacted

The project study area is located within sub-basin 03-06-15 of the Cape Fear River Basin (DENR 1999) and is part of USGS hydrologic unit 03030004 (USGS 1974). Gum Log Canal originates approximately one (1) mi (1.6 km) west of the intersection of US 301 and Walker Road and flows southwest to its confluence with Locks Creek, approximately one tenth (0.1) of a mile (0.2 km) south of the project study area. Gum Log Canal, from its source to Locks Creek, has been assigned Stream Index Number (SIN) 18-28-1 by the DWQ. An unnamed tributary (UT) flows southwest into Gum Log Canal and runs parallel to SR 1728. The UT to Gum Log Canal has not been assigned a separate SIN by the DWQ.

2. Water Resource Characteristics

A Best Usage Classification is assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. Gum Log Canal has been assigned a Best Usage Classification of C (DEM 1993, DENR 2002a). The C designation indicates waters that support aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation is any activity involving human body contact with water on an infrequent or incidental basis. The UT to Gum Log Canal has not been assigned a separate Best Usage Classification, and therefore shares the Best Usage Classification of its receiving waters, C.

No Outstanding Resource Waters (ORW), High Quality Waters (HQW), WS-I, or WS-II Waters occur within three (3) mi (4.8 km) upstream or downstream of the project study area (DEM 1993, DENR 2002a). Neither Gum Log Canal nor the UT to Gum Log Canal are designated as a North Carolina Natural and Scenic River, nor as a national Wild and Scenic River.

The National Pollutant Discharge Elimination System (NPDES) regulates permits for projects involving the construction, alteration, and/or operation of any sewer system, treatment works or disposal system and certain stormwater runoff which would result in a discharge into surface waters (DPA 1991). There are three permitted point source dischargers located downstream of the project study area on the Cape Fear River. They are listed in Table 2 below (DENR 2002b).

Table 2. NPDES Permitted Discharges.

Permit	Facility	Receiving Stream	Discharge (MGD)*	Distance from Study Area
NC0023957	PWC/Fayetteville-Cross Creek WWTP	Cape Fear River	22	1.3 mi (2.1 km) downstream
NC0076783	PWC/Fayetteville-Hoffer WTP	Cape Fear River	Not limited	3.0 mi (4.8 km) downstream
NC0050105	PWC/Fayetteville-Rockfish Creek	Cape Fear River	14	3.0 mi (4.8 km) downstream

*Million Gallons per Day

The Benthic Macroinvertebrate Ambient Network (BMAN) addresses long-term trends in water quality at monitoring sites by sampling for selected benthic macroinvertebrates (DEM 1989). This program has been replaced by the benthic macroinvertebrate monitoring program associated with the basinwide assessment for the Cape Fear River Basin (DENR 1999). DWQ assigns bioclassifications to streams and portions of streams based on species richness and overall biomass, which are considered reflections of water quality. The closest benthic monitoring station is located five tenths (0.5) of a mile (0.8 km) downstream from the project study area at Person Street over the Cape Fear River. This monitoring station received a bioclassification of Good-Fair in 1993 (DENR 2002c, DENR 1999). There are no benthic monitoring stations located on the UT to Gum Log Canal.

Another measure of water quality being used by the DWQ is the North Carolina Index of Biotic Integrity (NCIBI), which assesses biological integrity using the structure and health of the fish community. Neither Gum Log Canal nor its tributaries have been sampled to determine a NCIBI score as of the most recent Water Quality Management Plan (DENR 1999).

3. Potential Impacts to Water Resources

Gum Log Canal is not designated as Trout Waters or an Anadromous Fish Spawning Area. There are no federally Threatened and Endangered species documented within three (3) mi (4.8 km) upstream or downstream of the project study area. It is ESI's opinion that this project can be classified as a Case 3 by the BMPs for Bridge Demolition and Removal (NCDOT 1999). Case 3 bridge replacements have no special restrictions beyond those outlined in the BMPs for Protection of Surface Waters and BMPs for Bridge Demolition and Removal (NCDOT 1999). However, this project may be elevated to a Case 2 at the discretion of the NCWRC in the event that a moratorium is established to protect sunfish (*Lepomis* spp.). Case 2 allows no work at all in the water during the moratorium periods associated with fish migration, spawning, and larval recruitment into nursery areas (NCDOT 1999). If a sunfish moratorium is established, in-stream work would likely be banned during March 15 through June 30.

4. Impacts Related to Bridge Demolition and Removal

Section 402-2 of NCDOT's Standard Specifications for Roads and Structures is labeled **Removal of Existing Structure**. This section outlines restrictions and Best Management Practices for Bridge Demolition and Removal (BMP-BDRs), as well as guidelines for calculating maximum potential fill in the creek resulting from demolition.

The superstructure consists of reinforced concrete floor on timber joists. Although these components are slated for removal in a manner that will avoid dropping any components into Gum Log Canal, the potential exists for temporary fill of up to 35 cubic yards (27 cubic meters).

The substructure consists of three interior bents located within the stream channel. These bents are creosote timbers with piles encased in concrete. Although these components are slated for removal in a manner that will avoid dropping any components into Gum Log Canal, the potential exists for temporary fill up to 35 cubic yards (27 cubic meters).

Bridge components are slated for removal in a manner that will avoid dropping any bridge components into Gum Log Canal. However, due to the presence of reinforced concrete in the superstructure of the bridge and piles encased in concrete, the potential exists for up to approximately 70 cubic yards (54 cubic meters) of temporary fill being excavated from Gum Log Canal as a result of demolition activities.

During bridge removal procedures, NCDOT's BMP's will be utilized, including erosion control measures; therefore it is anticipated that removing the existing bents will result in no impact to surrounding surface waters

After construction activities are completed, abandoned existing approaches associated with the existing structure should be removed and revegetated in accordance with NCDOT guidelines.

Short-term impacts to water quality, such as sedimentation and turbidity, may result from construction-related activities. BMPs can minimize impacts during construction, including implementation of stringent erosion and sedimentation control measures, and avoidance of using wetlands as staging areas. Additional measures which can be taken to minimize water quality impacts include avoiding the placement of live concrete directly into the stream channel and preventing heavy equipment operations from being conducted in the stream channel.

Other impacts to water quality, such as changes in water temperature as a result of increased exposure to sunlight due to the removal of stream-side vegetation or increased shade due to the construction of the bridges, and changes in stormwater flows due to changes in the amount of impervious surface adjacent to the stream channels, can be anticipated as a result of this project. However, due to the limited amount of overall change in the surrounding areas, impacts are expected to be temporary in nature.

In-stream construction activities will be scheduled to avoid and minimize impacts to aquatic resources/organisms. Any specific moratorium dates will be determined by the NCWRC. No adverse long-term impacts to water resources are expected to result from the alternatives being considered. The proposed project calls for reducing the structure from two spans to a single span structure across Gum Log Canal, which will allow for continuation of present stream flow within the existing channel, thereby protecting stream integrity.

D. Biotic Resources

1. Existing Vegetation Patterns

Terrestrial distribution and composition of vegetation communities throughout the project study area reflect landscape-level variations in topography, soils, hydrology, and past and present land use practices. When appropriate, the vegetation community names have been adopted and modified from the NHP classification system (Schafale and Weakley 1990) and the descriptions written to reflect local variations within the project study area. One natural community was identified within the project study area: Mesic Mixed Hardwood Forest. In addition to this natural community, there are also areas of agricultural land and maintained/disturbed land.

Mesic Mixed Hardwood Forest – These forests occur in mesic upland areas protected from fire. These forests occur primarily on north facing bluffs and ravine slopes, less commonly on upland flats or islands surrounded by peatland or swamp communities. The mesic mixed hardwood forest within the project study area is located southwest of SR 1728 adjacent to Gum Log Canal. The canopy consists American beech (*Fagus grandifolia*), white oak (*Quercus alba*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), and black gum (*Nyssa sylvatica*). The shrub layer consists of flowering dogwood (*Cornus florida*) and mountain laurel (*Kalmia latifolia*).

Agricultural Land – The agricultural land within the project study area includes such areas as livestock pasture and plowed fields used for production of crops. The pasture is currently being used for production of cattle and crop production and occupies most of

the project study area north of SR 1728. Vegetation in this pasture is limited to hardy grasses and weeds such as wild onion (*Allium canadense*), dandelion (*Taraxacum officinale*), broom sedge (*Andropogon virginicus*), and fescue (*Festuca* sp.).

Maintained/Disturbed Land – The maintained/disturbed land within the project study area include residential homes, roadsides, industrial areas, and dirt roads/driveways. The vegetation within these areas includes ornamentals such as flowering dogwood, river birch (*Betula nigra*), azalea (*Rhododendron* spp.), and wax myrtle (*Myrica cerifera*). Herbaceous vegetation is limited to invasive weeds and grasses including broomsedge, wild onion, rye grass (*Lolium* sp.), fescue, Japanese honeysuckle (*Lonicera japonica*), and other maintained grasses.

2. Potential Impacts to Vegetation Communities

Potential impacts to vegetation communities are estimated based on the area of each community present within the proposed construction limits provided by Wilbur Smith Associates. A summary of potential vegetation community impacts is presented in Table 3 in acres (ac) and hectares (ha).

Table 3. Potential Impacts to Vegetation Communities.

VEGETATION COMMUNITY	Potential Impacts Acres (hectares)			
	Alternative 1 (Preferred)		Alternative 2	
	Impacts	Temp. Construction Impacts ^a	Impacts	Temp. Construction Impacts ^a
Mesic Mixed Hardwood Forest	0.60 (0.24)	0.63 (0.26)	0.12 (0.05)	0.14 (0.06)
Agricultural Land	0.17 (0.07)	0.38 (0.15)	1.49 (0.60)	0.25 (0.10)
Maintained/Disturbed Land	0.22 (0.09)	0.90 (0.36)	0.97 (0.39)	0.47 (0.19)
Total:	0.99 (0.40)	1.91 (0.77)	2.58 (1.04)	0.86 (0.35)
Total For Alternative^b:	2.90 (1.17)		3.44 (1.39)	

^a Temporary construction impacts are based on the portion of the impacts not included in the construction limits for the permanent structure.

^b Totals for vegetation communities do not include the open water area attributed to Gum Log Canal impervious road surface.

Potential impacts associated with a bridge replacement are generally limited to narrow strips adjacent to the existing bridge structure and roadway approach segments. The two alternatives presented above minimize potential impacts to the adjacent Mesic Mixed Hardwood Forest. Alternative 2 concentrates potential impacts in the maintained/disturbed land and has the least amount of potential impacts to Mesic Mixed Hardwood Forest. This alternative calls for the replacement of the existing structure, which will reduce permanent impacts to natural plant communities and limit community fragmentation. Alternative 1 has the least amount of total potential impacts while

minimizing potential impacts to agriculture lands through the reduction in the amount of roadway approach work required.

3. Wildlife

The project study area was visually surveyed for signs of terrestrial and aquatic wildlife. Little evidence of wildlife was observed during the field effort. Forests along streams such as Gum Log Canal provide cover and food and function as a migration corridor linking areas of more optimal habitats. Other expected wildlife species are those adapted to ecotones between the maintained roadsides and adjacent natural communities.

a. Terrestrial

One bird species was observed within the project study area, tufted titmouse (*Parus bicolor*). Other species expected to occur within the project study area include such species as great blue heron (*Ardea herodias*), Carolina chickadee (*Parus carolinensis*), downy woodpecker (*Picoides pubescens*), white-breasted nuthatch (*Sitta carolinensis*), ruby-crowned kinglet (*Regulus calendula*), eastern bluebird (*Sialia sialis*), white-throated sparrow (*Zonotrichia albicollis*), and common grackle (*Quiscalus quiscula*).

One mammal was observed within the project study area, gray squirrel (*Sciurus carolinensis*). Other species expected to be found in and around the project study area include raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), white-tailed deer (*Odocoileus virginianus*), and eastern cottontail (*Sylvilagus floridanus*).

No terrestrial reptiles were observed within the project study area. Species expected to occur within the project study area include eastern box turtle (*Terrapene carolina*), eastern garter snake (*Thamnophis sirtalis*), ringneck snake (*Diadophis punctatus*), and black rat snake (*Elaphe obsoleta*).

Terrestrial amphibian species observed within the project study area include squirrel treefrog (*Hyla squirella*) and spring peeper (*Pseudacris crucifer*). Other species expected to occur within the project study area include white-spotted slimy salamander (*Plethodon cylindraceus*), Fowler's toad (*Bufo woodhousei*), marbled salamander (*Ambystoma opacum*), and northern cricket frog (*Acris crepitans*).

b. Aquatic

The aquatic habitat located within the project study area includes Gum Log Canal and its unnamed tributary. Limited kick-netting, seining, dip-netting, electro-shocking and visual observation of stream banks and channel within the project study area were conducted in Gum Log Canal and the UT to Gum Log Canal to document the resident aquatic wildlife populations.

Benthic invertebrate organisms collected within the project study area were identified to at least Order, Family and species, if possible (McCafferty 1998). Gum Log Canal was sampled and the following organisms were identified including Asiatic clams (*Corbicula fluminea*), snails (Gastropoda), fishflies (Megaloptera: Corydalidae), dragonflies (Odonota: Gomphidae), crayfish (Decapoda), flies (Chironomidae: Simuliidae, Dixidae), mayflies (Trichoptera: Ephemeroptera: Heptageniidae, Caenidae, Baetidae), stoneflies (Plecoptera), beetles (Coleoptera: Elmidae, Dryopidae), and caddisflies (Trichoptera: Hydropsychidae, Phryganeidae, Philopotamidae, and Polycentropodidae).

The UT to Gum Log Canal was sampled and contained the following organisms: scuds (Amphipoda), sow bugs (Isopoda), snails (Gastropoda), fingernail clams (Sphaeriidae), caddisflies (Trichoptera: Hydropsychidae), alderflies (Megaloptera: Sialidae), flies (Diptera: Chironomidae), mayflies (Ephemeroptera: Caenidae, Baetidae), water bugs (Hemiptera: Corixidae, Veliidae), dragonflies and damselflies (Odonata: Calopterygidae, Protoneuridae, Gomphidae, Libellulidae), and beetles (Coleoptera: Hydrophilidae, Haliplidae, Chrysomelidae, Elmidae, Curculionidae) (McCafferty 1998).

Fish species collected from Gum Log Canal include pirate perch (*Aphredoderus sayanus*), margined madtom (*Noturus insignis*), bluehead chub (*Nocomis leptcephalus*), spottail shiner (*Notropis hudsonius*), and tessellated darter (*Etheostoma olmstedii*).

The UT to Gum Log Canal was also sampled and contained largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redbreast sunfish (*Lepomis auritus*), and eastern mosquitofish (*Gambusia holbrooki*).

No aquatic reptiles were observed within the project study area. Species expected to occur within the project study area include brown watersnake (*Nerodia taxispilota*), snapping turtle (*Chelydra serpentina*), banded water snake (*Nerodia fasciata*), and eastern cottonmouth (*Agkistrodon piscivorus*).

Green frog (*Rana clamitans melanota*) was the only aquatic amphibian species observed within the project study area. Other species expected to occur within the project study area include species such as bullfrog (*Rana catesbeiana*), southern leopard frog (*Rana utricularia*), and pickerel frog (*Rana palustris*).

4. Potential Impacts to Wildlife

Due to the lack of, or limited, infringement on natural communities, the proposed bridge replacement will not result in significant loss or displacement of known animal populations. Wildlife movement corridors are not expected to be significantly altered by the proposed project. Potential down-stream impacts to aquatic habitat will be avoided by bridging Gum Log Canal to maintain regular flow and stream integrity. In addition, temporary impacts to downstream habitat from increased sediment during construction are expected to be reduced by limiting in-stream work to an absolute minimum, except for the removal of the portion of the sub-structure below the water. Best Management Practices for Bridge Demolition and Removal (BMP-BDRs) will be followed to minimize impacts due to anticipated bridge demolition. BMPs for the protection of surface should be strictly enforced to reduce impacts.

E. Special Topics

1. Waters of the United States

Surface waters within the embankments of Gum Log Canal and the UT to Gum Log Canal are subject to jurisdictional consideration under Section 404 of the Clean Water Act as "waters of the United States" (33 CFR 328.3). The waters in Gum Log Canal within the project study area exhibit characteristics of riverine, lower perennial, unconsolidated bottom, cobble-gravel (R2UB1) waters (Cowardin *et al.* 1979). The waters in the UT to Gum Log Canal within the project study area exhibit characteristics of riverine, intermittent, unconsolidated bottom, sand bottom (R4UB2) waters (Cowardin *et al.* 1979).

Gum Log Canal is a perennial stream with moderate flow over substrate consisting of cobble-gravel and sand. The main channel is 25 ft (8 m) wide and an average of five (5) ft (2 m) deep. A geomorphic characterization of the stream section within the project study area indicates that Gum Log Canal is a "C" type stream (Rosgen 1996). These stream types occur in broad, alluvial valleys with terraces and have variable sinuosity. "C" channels also have well-developed floodplains and point bars in the meander bends. The "C" designation indicates that the stream is slightly entrenched with well-defined meandering channels (Rosgen 1996).

The UT to Gum Log Canal is approximately three (3) ft (1 m) wide and an average of two (2) ft (0.6 m) deep. The geomorphic characterization of the tributary indicates that the tributary is a “G” type stream (Rosgen 1996). These stream types occur in narrow valleys and are unstable, with grade control problems and high bank erosion rates. The “G” designation indicates that the stream is an entrenched “gully” with a low width/depth ratio on moderate gradients (Rosgen 1996).

Wetlands subject to review under Section 404 of the Clean Water Act (33 U.S.C. 1344) are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology within 12 inches [31 centimeters (cm)] the surface for a portion (12.5 percent) of the growing season (DOA 1987). Based on this three parameter approach, jurisdictional wetlands do not occur within the project study area.

2. Potential Impacts to Waters of the United States

Potential impacts to wetlands and open water areas are estimated based on the amount of each jurisdictional area within the proposed construction limits. Open water areas of Gum Log Canal (R2UB1) are included in this table, although impacts are not expected due to the use of channel-spanning structures. During Bridge Removal Procedures, NCDOT’s BMP’s will be utilized, including Erosion Control Measures. Therefore it is anticipated that removing the existing bents will result in no impact to surrounding surface waters. A summary of potential jurisdictional impacts is presented in Table 4 in acres and hectares or linear feet and meters, as appropriate.

Table 4. Potential Impacts to Jurisdictional Areas.

JURISDICTIONAL AREAS	Potential Wetland Impacts Acres (hectares)			
	Alternative 1 (Preferred)		Alternative 2	
	Impacts	Temporary Construction Impacts ^a	Impacts	Temporary Construction Impacts ^a
R2UB1 (Gum Log Canal)	0.02 (0.01)	0.63 (0.25)	0.02 (0.01)	0.08 (0.03)
R4UB2 (UT Gum Log Canal)	0.0	0.0	0.0	0.0
Total:	0.02 (0.01)	0.63 (0.25)	0.02 (0.01)	0.08 (0.03)
Total Wetland Impacts:	0.65 (0.26)		0.10 (0.04)	
	Potential Stream Impacts Linear feet (meters)			
Gum Log Canal	40 (12)	150 (46)	35 (11)	125 (38)
UT Gum Log Canal	0	0	0	0
Total:	40 (12)	150 (46)	35 (11)	125 (38)
Total Stream Impacts:	190 (58)		160 (49)	

^a Temporary construction impacts are based on the portion of the impacts not included in the construction limits for the permanent structure.

Both alternatives avoid potential impacts to UT Gum Log Canal. Alternative 1 and Alternative 2 each have the same amount of potential impacts, 0.02 ac (0.01 ha). Alternative 1 has the largest amount of temporary impacts, 0.63 ac (0.25 ha). Alternative 2 minimizes temporary impacts for Gum Log Canal to 125 linear ft (38 m). Both alternatives include use of a channel spanning structure that would avoid impacts to Gum Log Canal. The current alternatives will result in no wetland impacts associated with construction.

a. Permits

This project is being processed as a Categorical Exclusion (CE) under Federal Highway Administration (FHWA) guidelines. Nationwide Permit (NWP) #23 [33 CFR 330.5(a)(23)] has been issued by the COE for CEs due to expected minimal impact. DWQ has issued a General 401 Water Quality Certification for NWP #23. However, use of this permit will require written notice to DWQ. In the event that NWP #23 will not suffice, minor impacts attributed to bridging and associated approach improvements are expected to qualify under General Bridge Permit 031 issued by the Wilmington COE District. Notification to the Wilmington COE office is required if this general permit is utilized. NWP #33 may be required if temporary structures, work, and discharges, including cofferdams are necessary for this project and not covered within the CE.

4. Mitigation Evaluation

Avoidance – Due to the presence of surface waters and wetlands within the project study area, avoidance of all impacts is not possible. The proposed alternative avoids impacts to wetlands. Wetland and stream impacts are previously discussed in Section V.E.1.

Minimization – The alternatives presented were developed in part to demonstrate minimization of stream impacts. Impacts to the stream will be minimized during demolition by removing bridge components in a manner, which will avoid dropping any components into the creek channel. Bridge demolition impacts have been previously discussed in Section V.C.4. Employing 2 to 1 slopes where practicable can further minimize wetland impacts.

Mitigation - Compensatory mitigation is not anticipated for this project due to the limited nature of project impacts. However, utilization of BMPs is recommended in an effort to minimize impacts, including avoiding placing staging areas within the stream channel. Temporary impacts associated with the construction activities could be mitigated by replanting disturbed areas with native species and removal of any temporary fill material

within the floodplain upon project completion. Final mitigation requirements rest with the COE. Mitigation may be required for wetland impacts less than one tenth (0.1) if an acre (>0.04 ha).

F. Protected Species

1. Federal Protected Species

Species with the federal classification of Endangered (E) or Threatened (T), or officially proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The following federal protected species are listed for Cumberland County, see Table 5, US Fish and Wildlife Service (FWS) list dated March 7, 2002).

Table 5. Federally Protected Species.

Common Name	Scientific Name	Status	Biological Conclusion
American alligator	<i>Alligator mississippiensis</i>	T(S/A)	N/A
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	No Effect
Saint Francis' satyr	<i>Neonympha mitchellii francisci</i>	E	No Effect
Small-whorled pogonia	<i>Isotria medeoloides</i>	T	No Effect
Pondberry	<i>Lindera melissifolia</i>	E	No Effect
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	E	No Effect
Michaux's sumac	<i>Rhus michauxii</i>	E	Not Likely to Adversely Effect
American chaffseed	<i>Schwalbea americana</i>	E	No Effect

American alligator - American alligator is listed as threatened based on the similarity in appearance to other federally listed crocodilians; however, there are no other crocodilians within North Carolina. American alligators can be found in a variety of freshwater to estuarine aquatic habitats including swamp forests, marshes, large streams and canals, and ponds and lakes.

Biological Conclusion: Not applicable

NHP records indicate that the American alligator has been documented from the Cape Fear River two and three tenths (2.3) of a mile (3.7 km) northwest of the project study area. Potentially suitable habitat for American alligator does exist within the project study area, however, a biological conclusion is not required since this species is listed as T (S/A) by FWS.

Red-cockaded woodpecker (RCW) – This small woodpecker, seven (7) to eight and one half (8.5) inches (19.3 to 23.4 cm) long, has a black head, prominent white cheek

patch, and black-and-white barred back. Males often have red markings (cockades) behind the eye, but the cockades may be absent or difficult to see (Potter *et al.* 1980). Primary habitat consists of mature to over-mature southern pine forests dominated by loblolly (*Pinus taeda*), long-leaf (*P. palustris*), slash (*P. elliotii*), and pond (*P. serotina*) pines (Henry 1989). Primary nest sites for RCWs include open pine stands greater than 60 years of age with little or no mid-story development. Nest cavity trees tend to occur in clusters, which are referred to as colonies (FWS 1985). Foraging habitat is comprised of open pine or pine/mixed hardwood stands 30 years of age or older. Pine flatwoods or pine-dominated savannas which have been maintained by frequent natural fires serve as ideal nesting and foraging sites for this woodpecker. Development of a thick understory may result in abandonment of cavity trees. The woodpecker drills holes into the bark around the cavity entrance, resulting in a shiny, resinous buildup around the entrance that allows for easy detection of active nest trees (Henry 1989).

Biological Conclusion: No Effect

The project study area does not contain potentially suitable foraging and/or nesting habitat for the red-cockaded woodpecker. No pine-dominated tracts of land exist within the project study area, which are ideal nesting and foraging communities for the woodpecker. This project will have no impact on the red-cockaded woodpecker. A review of NHP records revealed no documentation of this species within three (3) mi (4.8 km) of the project study area.

Saint Francis' satyr – The Saint Francis' satyr is one of the rarest butterflies in eastern North America and is known from one locality in North Carolina. The butterfly is fairly small and dark brown in color. The wingspan ranges from 1.3 to 1.7 inches (3.3 to 4.3 cm) (FWS 1996). The Saint Francis' satyr has conspicuous eyespots on the lower surfaces of the wings, which are dark maroon-brown in the center surrounded by a yellow border. The outermost border is dark brown. The habitat required for this species consists primarily of open wet meadows dominated by wetland graminoids (grasses, sedges, rushes). Larval host plants are also believed to be graminoids.

Biological Conclusion: No Effect

No open grass/sedge dominated wetlands occur within the project study area, which offer ideal habitat for the Saint Francis' satyr. Since no potentially suitable habitat for the Saint Francis' satyr exists within the project study area, this project will not impact the species. NHP and FWS records indicate this listed subspecies is known to occur at only one locality, an artillery range at Fort Bragg.

Small whorled pogonia - The small whorled pogonia is a small-flowered terrestrial orchid which grows to about one (1) ft (0.3 m) high. It has a greenish or purplish stem and a whorl of five drooping, pale dusty green, widely rounded and pointed leaves

(Radford *et al.* 1968). The single, nearly stalkless flower is yellowish green, about one half (0.5) of an inch (1.3 cm) long and is surrounded by three (3) narrow sepals less than one (1) inch (2.5 cm) long. Flower production is from May to June, followed by an erect ellipsoidal capsule less than one (1) inch (2.5 cm) long. This species is found on moist hardwood slopes and along stream bottoms (Radford *et al.* 1968), usually in association with white pine (*Pinus strobus*) (Weakley 1993); it sometimes remains dormant up to 10 years between blooming periods (Newcomb 1977). The small whorled pogonia is widespread but very local in distribution, inhabiting the Mountains and upper Piedmont from southern Maine to northern Georgia (Weakley 1993).

Biological Conclusion: No Effect

No forested areas dominated by white pine are located within the project study area that would provide potentially suitable habitat for this species. Forested slopes within the project study area, while hardwood dominated, do not contain the white pine component that is typically found in association with small whorled pogonia. Therefore, potentially suitable habitat for this species does not occur in the project study area and this project will not impact this species. A review of NHP records revealed no documentation of this species within three (3) mi (4.8 km) of the project study area.

Pondberry (southern spicebush) - Pondberry is a deciduous shrub with a limited distribution occurring in two portions of the southeastern United States, the Mississippi Valley and the Coastal Plain of the Carolinas (FWS 1993). Within the two portions of its range, pondberry is known to occupy different habitats. While pondberry is known from hardwood depressional areas with perched water tables in the Mississippi Valley, in the Carolinas pondberry occurs along margins of sink holes, ponds, and depressions in pinelands (FWS 1993). Within North Carolina, potential habitat for pondberry is described as: 1) shallow ponds with a sandy substrate, especially sites containing the shrub pondspice (*Litsea aestivalis*); and 2) Carolina bays containing a combination of pond cypress (*Taxodium ascendens*) with loblolly pine and red maple (*Acer rubrum*) (Leonard 1995).

Biological Conclusion: No Effect

Potentially suitable habitat in the form of Carolina bays, sinkholes, or other seasonally flooded wetlands does not occur in the project study area. A review of NHP records revealed no documentation of this species within three (3.0) mi (4.8 km) of the project study area. Therefore, construction of the proposed project will not result in any impacts to this species.

Rough-leaved loosestrife - The rough-leaved loosestrife is a rhizomatous perennial that often reaches the height of two (2) ft (0.6 m); its leaves are sessile and entire, in

whorls of three (3) to four (4). Five-petaled yellow flowers, approximately one half (0.5) of an inch (1.3 cm) across, are produced on a loose terminal raceme from late May to June; seeds are formed by August, but the small, rounded capsules do not dehisce until October. Preferred habitat of the rough-leaved loosestrife consists of the ecotone between longleaf pine savannas and wetter, shrubby areas, where lack of canopy vegetation allows abundant sunlight into the herb layer. This species is fire maintained; suppression of naturally occurring fires has contributed to the loss of habitat in our state. Drainage of habitat may also have adverse effects on the plant (FWS 1994).

Biological Conclusion: No Effect

Potentially suitable habitat for this species in the form of the ecotonal zones between pocosins and sandhills or isolated openings within pocosin wetlands does not occur in the project study area. A review of NHP records revealed no documentation of this species within three (3) mi (4.8 km) of the project study area. Therefore, construction of the proposed project will not result in any impacts to this species.

Michaux's sumac - Michaux's sumac is a densely pubescent, deciduous, rhizomatous shrub, usually less than two (2) ft (0.6 m) high. The alternate, compound leaves consist of nine (9) to 13 hairy, round-based, toothed leaflets borne on a hairy rachis that may be slightly winged (Radford *et al.* 1968). Small male and female flowers are produced during June on separate plants; female flowers are produced on terminal, erect clusters followed by small, hairy, red fruits (drupes) in August and September. Michaux's sumac tends to grow in disturbed areas where competition is reduced by periodic fire or other disturbances, and may grow along roadside margins or utility rights-of-way. In the Piedmont, Michaux's sumac appears to prefer clay soil derived from mafic rocks or sandy soil derived from granite; in the Sandhills, it prefers loamy swales (Weakley 1993). Michaux's sumac ranges from south Virginia through Georgia in the inner Coastal Plain and lower Piedmont.

Biological Conclusion: Not Likely to Adversely Effect

Potentially suitable habitat for Michaux's sumac exists within the project study area along roadside margins and other similarly disturbed plant communities. A systematic survey of all potentially suitable habitat was conducted by ESI biologists in June 2001 during the flowering season for this species. No individuals of Michaux's sumac were observed during the survey. Therefore, construction of the proposed project should not affect Michaux's sumac. A review of NHP records revealed no documentation of this species within three (3) mi (4.8 km) of the project study area.

American chaffseed - Chaffseed is a perennial root-parasitic herb that stands 12 to 24 inches (31 to 61 cm) tall. The alternately-leaved plant is erect and simple, or branched

only at the base. The fleshy leaves are yellow-green or dull green with red undertones, and become smaller and narrower from the base of the plant to the top (Kral 1983). Flowers are arranged on a spike-like raceme and bloom from April to June. Chaffseed occurs in grass/sedge assemblages with moist acidic sandy loams or sandy peat loams. These assemblages typically exist in moist pine flatwoods, savannas, bog borders, and open oak woods.

Biological Conclusion: No Effect

Potentially suitable habitat for this species in the form of open, frequently burned long leaf pine savannas does not occur in the project study area. The shrub layer in forested areas within the project study area is too dense to provide potentially suitable habitat for this species. Therefore, construction of the proposed project should not affect American chaffseed. A review of NHP records revealed no documentation of this species within three (3) mi (4.8 km) of the project study area.

2. Federal Species of Concern

The March 7, 2002 FWS list also includes a category of species designated as "Federal species of concern" (FSC). The FSC designation provides no federal protection under the ESA for the species listed. The presence of potential suitable habitat (Amoroso 1999, LeGrand *et al.* 2001) within the project study area has been evaluated for the following FSC species listed for Cumberland County (Table 6).

THIS SECTION INTENTIONAL LEFT BLANK

Table 6. Federal Species of Concern (FSC).

Common Name	Scientific Name	Potential Habitat	State Status ^a
Bachman's sparrow	<i>Aimophila aestivalis</i>	N	SC
Southern hognose snake	<i>Heterodon simus</i>	N	SR (PSC)
Northern Pine Snake	<i>Pituophis melanoleucus melanoleucus</i>	N	SC
Carolina gopher frog	<i>Rana capito capito</i>	N	SC(PT)
Atlantic pigtoe	<i>Fusconaia masoni</i>	Y	T (PE)
Yellow lampmussel	<i>Lampsilis cariosa</i>	Y	T (PE)
Georgia indigo-bush	<i>Amorpha georgiana</i> var. <i>georgiana</i>	N	E
Sandhills milkvetch	<i>Astragalus michauxii</i>	N	T
Venus flytrap	<i>Dionaea muscipula</i>	N	C-SC
White wicky	<i>Kalmia cuneata</i>	N	E-SC
Sandhills bog lily	<i>Lilium iridollae</i>	N	E-SC
Bog spicebush	<i>Lindera subcoriacea</i>	N	E
Pondspice	<i>Litsea aestivalis</i>	N	C
Boykin's lobelia	<i>Lobelia boykinii</i>	N	C
Loose watermilfoil	<i>Myriophyllum laxum</i>	N	T
Savanna cowbane	<i>Oxypolis ternata</i>	N	W1
Carolina grass-of-parnassus	<i>Parnassia caroliniana</i>	N	E
Wavyleaf wild quinine	<i>Parthenium radfordii</i> (= <i>integrifolium</i> var. <i>mabryanum</i>)	N	W1
Conferva pondweed	<i>Potamogeton confervoides</i>	N	C
Spiked medusa	<i>Pteroglossaspis ecristata</i> (= <i>Eulophia ecristata</i>)	N	E
Sandhills pixie-moss	<i>Pyxidantha barbulata</i> var. <i>brevifolia</i>	N	E
Awnead meadowbeauty	<i>Rhexia aristosa</i>	N	T
Carolina goldenrod	<i>Solidago pulchra</i>	N	E
Spring-flowering goldenrod	<i>Solidago verna</i>	N	T
Pickering's dawnflower	<i>Stylisma pickeringii</i> var. <i>pickeringii</i>	N	E
Carolina asphodel	<i>Tofieldia glabra</i>	N	C
Roughleaf yellow-eyed grass	<i>Xyris scabrifolia</i>	N	C

^a E - Endangered, T - Threatened, SC - Special Concern, C - Candidate, W - Watch List, P - Proposed, SR - Significantly Rare.

NHP records indicate that one (1) FSC species has been documented within three (3) mi (4.8 km) of the project study area. The yellow lampmussel has been documented two (2) mi (3.2 km) northwest of the project study area in the Cape Fear River. This occurrence is approximately six (6) river miles (10 km) from the project study area.

3. State Protected Species

Plant and animal species which are on the North Carolina state list as Endangered (E), Threatened (T), or Special Concern (SC), receive limited protection under the North Carolina Endangered Species Act (G.S. 113-331 *et seq.*) and the North Carolina Plant Protection Act of 1979 (G.S. 106-202 *et seq.*).

In addition to the above referenced FSC which also carries a North Carolina listing, the eastern coral snake [*Micrurus fulvius*, SR (PE)] has been documented two and one half (2.5) mi (4.0 km) northwest of the project study area. Two state protected mussel species have been found in the Cape Fear River two (2) mi (3.2 km) northwest of the project study area: pod lance (*Elliptio folliculata*), and the Roanoke slabshell (*Elliptio roanokensis*). The occurrences of these mussel species is approximately six (6) river miles (10 km) from the project study area.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historical Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires Federal Agencies to take into account the effect of their undertakings (federally funded, licensed, or permitted projects) on properties listed in or eligible for the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings.

B. Historic Architecture

In a November 5, 2001 memorandum, see Appendix, the North Carolina State Historic Preservation Office (HPO) state "no comment" regarding this project. A field survey of the Area of Potential Effects (APE) was conducted on March 19, 2002. The HPO concurred that there are no eligible structures within the APE on April 12, 2002. A concurrence form was signed which documents these finding and is found in the appendix.

C. Archaeology

Based on the November 5, 2001 memorandum from the HPO, see attached, denoting “no comment” regarding this project and a review by NCDOT Archaeological staff it was determined that the proposed project will not impact any archaeological sites that are eligible for the NRHP.

VII. ENVIRONMENTAL EFFECTS

The project is expected to have an overall positive impact. Replacements of an inadequate bridge will result in safer traffic operations.

The project is a Federal “Categorical Exclusion” due to its limited scope and lack of significant environmental consequences.

The bridge replacement will not have an adverse effect on the quality of the human or natural environment with the use of current NCDOT standards and specifications.

The project does not conflict with any plan, existing land use, or zoning regulation. No significant change in land use is expected to result from construction of the project.

No Adverse impact on families or communities is anticipated. Right of way acquisition will be limited. No relocatees are expected with implementation of the proposed alternative.

No adverse effect on public facilities or services is anticipated. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

There are no publicly owned recreational facilities, or wildlife and waterfowl refuges of national, state, or local significance in the vicinity of the project.

No North Carolina Geodetic Survey control monuments will be impacted during construction of this project.

The Farmland Protection Policy Act requires all federal agencies or the representatives to consider potential impacts to prime and important farmland soils be all land acquisition and construction projects. Prime and important farmland soils are defined by the Natural Resources Conservation Service (NRCS). Since there are no prime or important farmlands in the immediate vicinity of the proposed bridge the Farmland Protection Policy does not apply.

This project is an air quality “neutral” project, so it is not required to be included in the regional emission analysis (if applicable) and a project level CO analysis is not required.

The traffic volumes will not increase or decrease because of this project. There are no receptors located in the immediate project area. The project’s impact on noise and air quality will not be significant.

Any noise levels increases during construction but will be temporary. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 722) and for air quality (1990 CAAA and NEPA) and no additional reports are required.

As Examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section and the North Carolina Department of Human Resources, Solid Waste Management Section revealed no hazardous waste sites in the project area.

On the basis of the above discussion, it is concluded that no significant adverse environmental effects will result from implementation of the project.

VIII. PUBLIC INVOLVEMENT

Efforts were taken early in the planning process to contact local officials to involve them in the project development with a scoping letter. Additionally, 67 newsletters detailing the alternatives considered were mailed to citizens in the vicinity of the project. Newsletters were also mailed to local officials. Two comments were received from citizens; both supported the bridge replacement but were concerned right-of-way requirements for the project.

IX. AGENCY COMMENTS

Comments were received from Army Corps of Engineers, US Fish and Wildlife Service, North Carolina Department of Crime Control and Public Safety, State Historic Preservation Office, and local officials. Responses to the project scoping letter were not received from NCDENR Division of Water Quality.

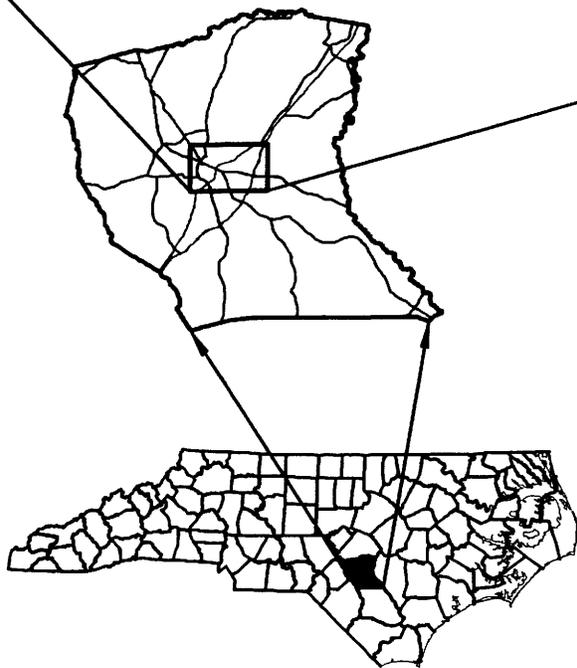
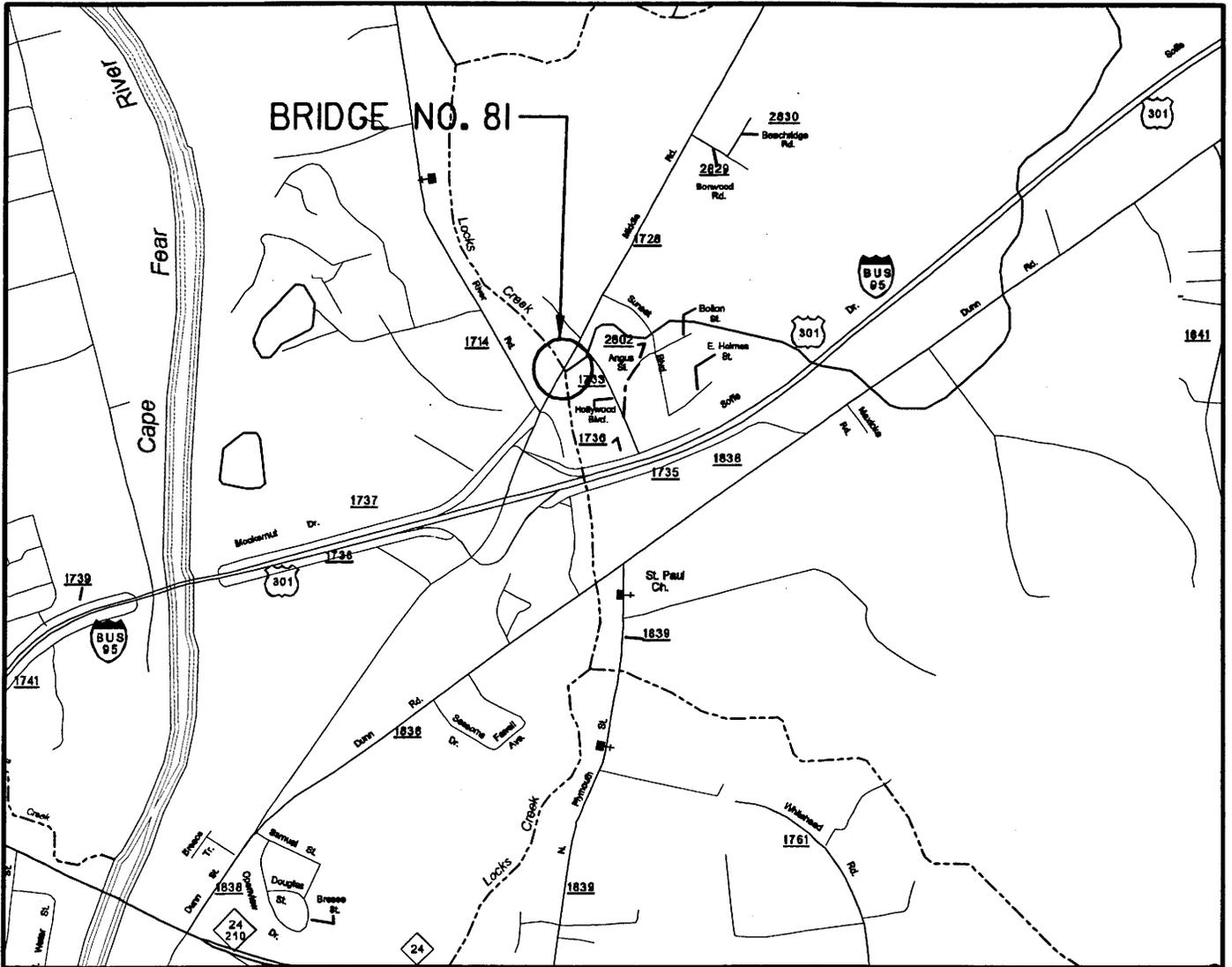
X. REFERENCES

- Amoroso, J.L. 1999. Natural Heritage Program List of the Rare Plant Species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health and Natural Resources, Raleigh. 85 pp.
- Burkhead, N.M. and R.E. Jenkins. 1991. Fishes. Pp 321-409 *in*: K. Terwilliger (ed.), Virginia's Endangered Species. The McDonald and Woodward Publishing Company, Blacksburg, Va.
- Clarke, A.H. 1985. The Tribe Alasmidontini (Unionidae: Anodontidae), Part II: *Lasmigona* and *Simpsonaias*. Smithsonian Institution Press, Washington, D.C. 75pp.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC. 103 pp.
- Department of the Army (DOA). 1987. Corps of Engineers Wetlands Delineation Manual. Tech. Rpt. Y-87-1. US Army Engineer Waterways Experiment Station, Vicksburg, MS. 100 pp.
- Department of Environment and Natural Resources (DENR). 2002a. Water Quality Stream Classifications Downloaded from <http://h2o.ehnr.state.nc.us/strmclass/alphaold/yad.html> on 19 February 2002..
- Department of Environment and Natural Resources (DENR). 2002b. Active NPDES Permits. <http://h2o.enr.state.nc.us/NPDES/documents/download.xls> on 19 February 2002.
- Department of Environment and Natural Resources (DENR). 2002c. Biological Assessment Unit. <http://www.esb.enr.stae.nc.us/BAUwww/benthosdata.pdf> on 19 February 2002..
- Division of Environmental Management (DEM). 1989. Benthic Macroinvertebrate Ambient Network (BMAN) Water Quality Review, 1983-1987. North Carolina Department of Environment, Health, and Natural Resources, Raleigh. 193 pp.
- Division of Environmental Management (DEM). 1993. Classifications and Water Quality Standards Assigned to the Waters of the Yadkin-Pee Dee River Basin. North Carolina Department of Environment, Health, and Natural Resources, Raleigh.
- Division of Water Quality (DWQ). 1998. Yadkin- Pee Dee River Basinwide Water Quality Management Plan. North Carolina Department of Environment, Health, and Natural Resources, Raleigh..
- Division of Planning and Assessment (DPA). 1991. North Carolina Environmental Permit Directory. North Carolina Department of Environment, Health, and Natural Resources, Raleigh.
- Gilbert, C.R. 1989. Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (Mid-Atlantic Bight)--Atlantic and Shortnose Sturgeons. Fish and Wildlife Service Biological Report 82(11.122). U.S. Department of the Army Corps of Engineers TR EL-82-4. 28 pp.

- Hamel, P.B. 1992. Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC. 437 pp.
- Henry, V. G. 1989. Guidelines for Preparation of Biological Assessments and Evaluations for the Red-Cockaded Woodpecker. U. S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia. 13pp.
- Keferl, E.P. 1991. A Status Survey for the Carolina Heelsplitter (*Lasmigona decorata*), a Freshwater Mussel Endemic to the Carolinas. Report prepared for the U.S. Department of the Interior, Fish and Wildlife Service, and North Carolina Wildlife Resources Commission. 51pp.
- LeGrand, H.E., Jr., S.P. Hall, and J.T. Finnegan. 2001. Natural Heritage Program List of the Rare Animal Species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health and Natural Resources, Raleigh. 90 pp.
- Martof, B.S., W.M. Palmer, J.R. Bailey, and J.R. Harrison III. 1980. Amphibians and Reptiles of the Carolinas and Virginia. The University of North Carolina Press, Chapel Hill, NC. 264 pp.
- McCafferty, W. P. 1998. Aquatic Entomology. Jones and Bartlett Publishers, Sudbury, MA. 448pp.
- Menhinick, E.F. 1991. The Freshwater Fishes of North Carolina. North Carolina Wildlife Resources Commission, Raleigh. 227 pp.
- North Carolina Department of Transportation (NCDOT). 1999. Best Management Practices For Bridge Demolition and Removal. NCDOT, Raleigh. 3 pp.
- Palmer, W.M. and A.L. Braswell. 1995. Reptiles of North Carolina. The University of North Carolina Press, Chapel Hill, NC. 412 pp.
- Porter, D.M., and T.F. Wieboldt. 1991. Vascular Plants. Pp.51-171 in: K. Terwilliger (ed.), Virginia's Endangered Species: Proceedings of a Symposium. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. 672 pp.
- Potter, E.F., J.F. Parnell, and R.P. Teulings. 1980. Birds of the Carolinas. The University of North Carolina Press, Chapel Hill, NC. 408 pp.
- Radford, A. E., H.E. Ahles, and C.R. Bell. 1968. Manual of the Vascular Flora of The Carolinas. The University of North Carolina Press, Chapel Hill, NC. 1138 pp.
- Rohde, F.C., R.G. Arndt, D.G. Lindquist, and J.F. Parnell. 1994. Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware. The University of North Carolina Press, Chapel Hill, NC. 222 pp.
- Rosgen, D. 1996. Applied River Geomorphology. Printed Media Companies, Minneapolis, Minnesota.
- Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health, and Natural Resources. Raleigh. 325 pp.

- U.S. Department of Agriculture (USDA). 2000. Soil Survey of Anson County, North Carolina. USDA Soil Conservation Service (CD-ROM).
- U.S. Fish and Wildlife Service (FWS). 1983 Polkton National Wetlands Inventory Map
- U.S. Fish and Wildlife Service. 1983 Russellville National Wetlands Inventory Map
- U.S. Fish and Wildlife Service. 1985. Red-cockaded Woodpecker Recovery Plan. U.S. Department of the Interior, Southeast Region, Atlanta, Georgia. 88 pp.
- U.S. Fish and Wildlife Service. 1987. Habitat Management Guidelines for the Bald Eagle in the Southeast Region. U.S. Department of the Interior, U.S. Fish and Wildlife Service. 8 pp.
- U.S. Fish and Wildlife Service. 1994. Schweinitz's Sunflower Recovery Plan. Atlanta, GA. 28 pp.
- U.S. Fish and Wildlife Service. (FWS) 2001. Endangered, Threatened, and Candidate Species and Federal Species of Concern, By County, In North Carolina. Asheville, NC. 51 pp.
- U.S. Geological Survey (USGS). 1970 Polkton Quadrangle.
- U.S. Geological Survey (USGS). 1971 Russellville Quadrangle.
- U.S. Geological Survey (USGS). 1974. Hydrologic Units Map, State of North Carolina.
- Webster, W.D., J.F. Parnell, and W.C. Biggs, Jr. 1985. Mammals of the Carolinas, Virginia, and Maryland. The University of North Carolina Press, Chapel Hill, NC. 255 pp.

FIGURES



CUMBERLAND COUNTY



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 PROJECT DEVELOPMENT AND
 ENVIRONMENTAL ANALYSIS BRANCH

BRIDGE NO. 81
SR 1728 OVER GUM LOG CANAL
CUMBERLAND COUNTY
B-4093

VICINITY MAP

FIGURE 1



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH

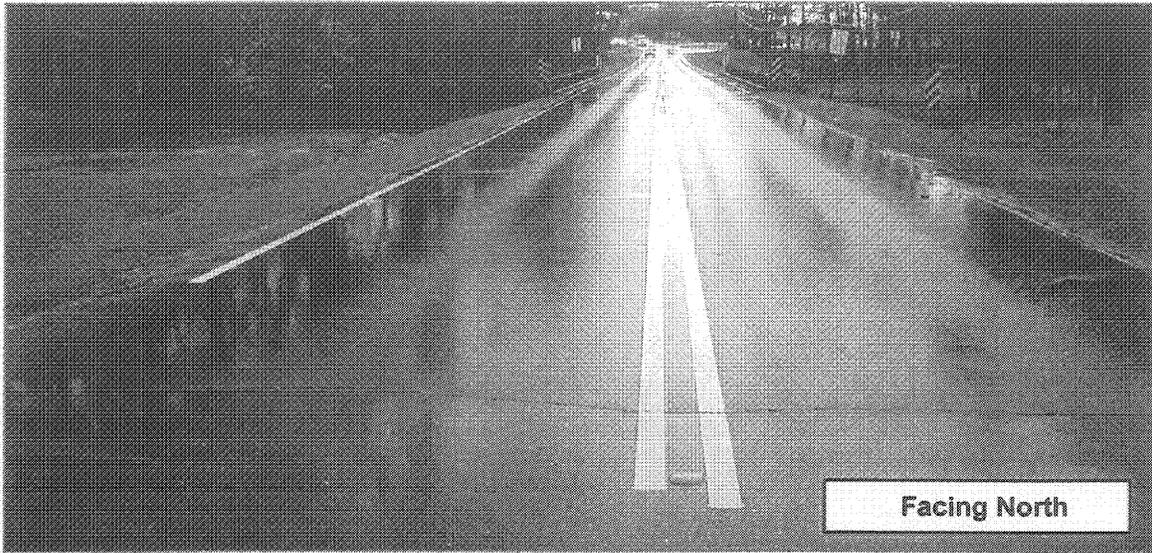
B-4093

CUMBERLAND COUNTY

BRIDGE #81 OVER GUM LOG CREEK

SEPTEMBER 2002 NOT TO SCALE

FIGURE 2



Facing North



Facing South



Facing Downstream

B-4093
Replacement of Bridge
Bridge No. 81
SR 1728 over
Gum Log Creek
Cumberland County

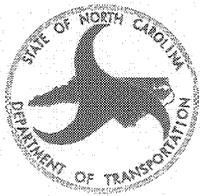
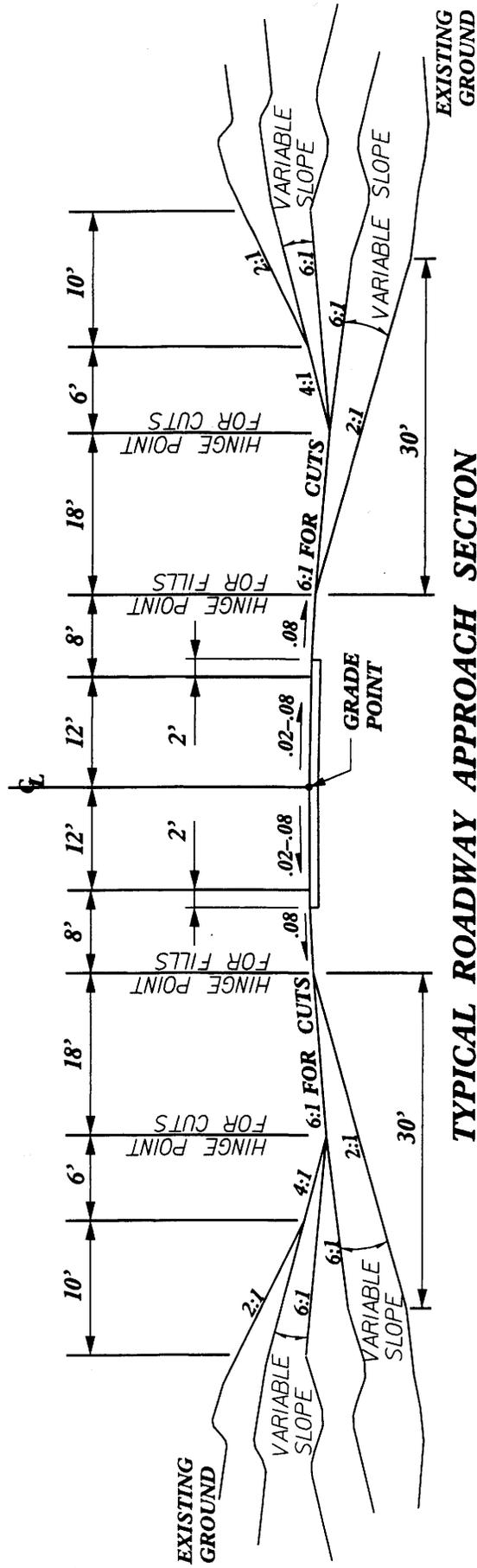
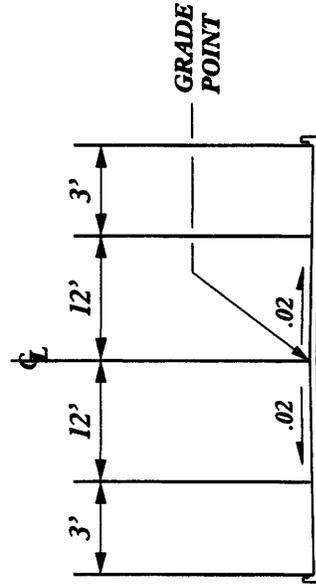


FIGURE 3



TYPICAL ROADWAY APPROACH SECTION



TYPICAL BRIDGE SECTION

TRAFFIC DATA

ADT 2001	2800
ADT 2025	5400
DUAL	3%
TTST	2%

FUNCTIONAL CLASSIFICATION: COLLECTOR (URBAN)



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 PROJECT DEVELOPMENT AND
 ENVIRONMENTAL ANALYSIS BRANCH

CUMBERLAND COUNTY
 BRIDGE NO. 81 ON SR 1728
 OVER GUM LOG CANAL

B-4093

APPENDIX

**U.S. ARMY CORPS OF ENGINEERS
Wilmington District**

Action ID: 200101375

County: Cumberland

Notification of Jurisdictional Determination

Requestor:

Mr. William D. Gilmore, P.E., Manager
Project Development & Environmental Analysis
1548 Mail Service Center
Raleigh, N.C. 27699-1548

Authorized Agent:

Josh Witherspoon
Environmental Services Inc.
524 New Hope Road
Raleigh, North Carolina 27610

Size and Location of Project (waterbody, Highway name/number, town, etc.): TIP Project No. B-4093, Bridge No. 81 on SR-1728 over Locks Creek, Cumberland County, North Carolina.

Basis for Determination: Onsite field inspection of jurisdictional area.

On **October 10, 2001**, the undersigned inspected the Section 404 jurisdictional line as field delineated by the NCDOT and/or its representatives for the subject NCDOT project/corridor. The project site was inspected and the delineated jurisdictional line was found to accurately reflect the limits of Corps jurisdiction. The field delineated jurisdictional limits, as shown on the attached plan(s), can be relied on for project planning and impact assessment. This verification is valid for five (5) years from the date of this letter.

Any placement of dredged or fill material within the delineated jurisdictional limits will require Department of the Army authorization pursuant to Section 404 of the Clean Water Act, as amended (33 USC 1344). Any un-authorized placement of dredged or fill material within the delineated jurisdictional limits would be a violation of Section 301 of the Clean Water Act (33 USC 1311) and subject to enforcement action. If you have any questions regarding this verification or the Corps of Engineers' regulatory program, please contact Mr. Richard K. Spencer at 910-251-4172.

Project Manager Signature



Richard K. Spencer

Date October 24, 2001

Expiration Date October 24, 2006

Attachments



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

July 15, 2002

Mr. Mike Penny
North Carolina Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Penny:

This responds to your letter of October 3, 2001, requesting comments on nine bridge replacement projects. Five of these projects are within the area covered by this office. Our biologist working on projects of the North Carolina Department of Transportation (NCDOT) at that time, Tom McCartney, requested survey data on federally protected species from the consultant, Wilbur Smith Associates. The requested information was supplied to the Service in late March 2002 at Mr. McCartney's retirement. In the transition to a new NCDOT biologist, the new material was filed under the assumption that comments had been provided. The US Fish and Wildlife Service (Service) regrets the delay in providing these comments and appreciates your efforts to bring this oversight to our attention. This report provides scoping information in accordance with provisions of the Fish and Wildlife, Coordination Act (FWCA) (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543). This report also serves as initial scoping comments to federal and state resource agencies for use in their permitting and/or certification processes for this project.

The bridges scheduled for replacement are:

1. B-3680, Moore County, Bridge No. 2 on US 15/501 over CSX Railroad;
2. B-3830, Columbus County, Bridge No. 363 and 364 on SR 1947 over Friar Swamp;
3. B-4093, Cumberland County, Bridge No. 81 on SR 1728 over Gum Log Creek
4. B-4205, Montgomery County, Bridge No. 133 on SR 1310 over Doomas Creek, and;
5. B-4273, Scotland/Hoke Counties, Bridge No. 47 on US 401 over the Lumber River

General Fish and Wildlife Habitat and Wetlands

For each project, we recommend the following conservation measures to avoid or minimize adverse environmental impacts to fish and wildlife resources:

1. Wetland impacts should be avoided and minimized to the maximum extent practical as outlined in Section 404 (b)(1) of the Clean Water Act Amendments of 1977. Areas

exhibiting high biodiversity or ecological value important to the watershed and region should be avoided. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons.

2. Off-site detours should be used rather than construction of temporary, on-site bridges. For projects requiring an on-site detour in wetlands or open water, such detours should be aligned along or adjacent to existing, roadways, utility corridors, or previously developed areas in order to minimize habitat fragmentation and encroachment. At the completion of construction, the entire detour area, including any previous detours from past construction activities, should be entirely removed and the impacted areas should be planted with appropriate, endemic vegetation, including trees if necessary;
3. If unavoidable wetland impacts are proposed, every effort should be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities to protect mitigation areas in perpetuity, preferably via conservation easement, should be explored at the outset;
4. In waterways that may serve as travel corridors for fish, in-water work should be avoided during moratorium periods associated with migration, spawning, and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 15;
5. Best Management Practices (BMP) for Protection of Surface Waters should be implemented; and,
6. Activities within designated riparian buffers should be avoided or minimized.

Federal Species of Concern and State Listed Species

Federal Species of Concern (FSC) are those plant and animal species for which the Service remains concerned, but further biological research and field study are needed to resolve the conservation status of these taxa. Although FSCs receive no statutory protection under the ESA, we would encourage the NCDOT to be alert to their potential presence, and to make every reasonable effort to conserve them if found. The North Carolina Natural Heritage Program should be contacted for information on species under state protection.

Federally Protected Species

The Natural Resources Technical Reports (NRTR) make determinations that a project will not affect a particular species, primarily plants, based on surveys in the recent past. If actual construction is several years away, the Service believes such determinations are premature and

that additional surveys will be required. It would be more appropriate to note that suitable habitat or the actual species was not found during preliminary surveys and such evidence provides early indications that the project is not likely to adversely affect the species.

Effect determinations for plants based on surveys within the project area may require work at a particular time of year for accurate identification. The biological conclusions of the NCDOT for plants should include the time of year that a survey was conducted, the person hours of surveying, and the approximate size of the area surveyed. Surveys should be done within two or three years of actual construction for those species inhabiting stable and/or climax communities. Plant species that utilize disturbed communities, e.g., Michaux sumac (*Rhus michauxii*) and Cooley's meadowrue (*Thalictrum cooleyi*), should be done within two years of actual construction if vegetation disturbing activities, e.g., regular mowing or timber harvesting, occur at the project site.

If surveys for a federally protected species should determine that a given project would adversely affect the species, a biological assessment (BA) may be prepared to fulfill the section 7(a)(2) requirement and in determining whether formal consultation with the Service is necessary. Please notify this office with the results of the surveys for the listed species that may occur in the project area. Please include survey methodologies and an analysis of the effects of the action, including consideration of direct, indirect, and cumulative effects.

Project Specific Comments

B-3680 (Moore County, Bridge No. 2 on US 15/501 over CSX Railroad)

The NRTR presents three design alternatives for the bridge replacement that vary in environmental impacts. Based on Table 2 (p. 8), the Service recommends Alternative 1 since it is the only alternative that would avoid all impacts to Piedmont alluvial forest and has the least amount of impacts on mixed mesic hardwood forest. Table 3 shows that impacts to jurisdictional wetlands for the Alternatives 1-3 are 1.10, 1.44, and 2.85 acres, respectively. However, these tabular data do not seem to correspond to the photographic presentation of the alternatives. These figures indicate that Alternative 2 would avoid most wetlands in the project area while Alternative 1 would cross a wetland just east of US 1. The Service recommends future design work seek to further minimize impacts to wetlands, especially forested wetlands which provide valuable wildlife habitat.

The NRTR accurately notes the four federally protected species for Moore County. The report states that habitat for the Cape Fear shiner (*Notropis mekistocholas*), red-cockaded woodpecker (RCW) (*Picoides borealis*), and American chaffseed (*Schwalbea americana*) do not exist in the project area. Surveys for Michaux sumac (*Rhus michauxii*) did not find the plant. Data on known locations of these species available to the Service indicate that they have not been found in the immediate vicinity of the project. Therefore, current data suggests that the project will not impact species protected by the ESA.

B-3830 (Columbus County, Bridge No. 363 and 364 on SR 1947 over Friar Swamp)

The NRTR for these two bridge replacements has not been released and design alternatives are still under consideration. The major issues for this project include impacts to wetlands, state-designed Outstanding Resource Water (ORW) that flow into Lake Waccamaw, and the Federally threatened Waccamaw silverside (WS) (*Menidia extensa*), a small (1.2 to 2.6 inches) fish endemic to the lake where it occurs in schools near the surface in open water. Furthermore, critical habitat has been designated for the WS that includes all of the lake up to the mean high water level that generally includes the lower reaches of stream flowing into the lake up to SR 1947. If a temporary detour bridge is required, this structure should be on the side of the existing structure away (north) from the lake. Such placement would avoid issues of adverse modification to critical habitat. Impacts can also be minimized by not installing "weep holes" or other structures on the bridge that would allow run-off or degrade water quality in the creek or lake. Overall, water run-off from structures should be minimized or avoided if at all possible. The NCDOT should use BMPs and effective sediment and erosion control measures to minimize debris and sediment entering the creek and lake. Finally, potential impacts would be minimized if construction is performed outside the WS spawning period of March through July.

The wetlands in the project enhance the water quality of Lake Waccamaw and provide high quality fish and wildlife habitat. Every effort should be made to minimize temporary impacts and avoid the permanent loss of such areas.

In addition to the WS, the other federally protected species in Columbus County include the RCW, shortnose sturgeon (*Acipenser brevirostrum*) (under the jurisdiction of the National Marine Fisheries Service), Cooley's meadowrue (*Thalictrum cooleyi*), and rough-leaved loosestrife (*Lysimachia asperulaefolia*). The NCDOT should determine project impacts on these species through either a thorough comparison of habitat requirements with conditions at the site or actual field surveys.

The Carolina pygmy sunfish (*Elassoma boehkei*), a FSC, has been reported near the project site. These small fish occur in heavy vegetated shallows of ponds, sloughs, and creeks. This FSC would benefit from all measures to preserve water quality and prevent the loss of vegetated wetlands.

B-4093 (Cumberland County, Bridge No. 81 on SR 1728 [Middle Road] over Gum Log Canal)

The NRTR states that two alternatives are under consideration for the project. Alternative 1 would construct the new bridge at the same location and use a temporary detour bridge. Alternative 2 would construct a new bridge approximately 20 feet upstream of the existing structure. Both alternatives would have the same permanent impacts, 0.02 acre, on jurisdictional wetlands. If Alternative 2 is implemented, the NCDOT should discuss the removal of the existing structure and the restoration of the waterway and associated wetlands at that site.

The Service does not concur with the preliminary determination that the project would have no effect on the small whorled pogonia (*Isotria medeoloides*), a Federally threatened perennial plant. This species is generally known from open, dry, deciduous woods with acid soil. The NRTR states that the species is characteristic of moist hardwood slopes and along stream bottoms “usually” in association with white pine. The Biological Conclusion (p. 14) is based on the absence of hardwood forests “dominated” by white pine. We do not believe that this plant requires woodlands with, or dominated by, white pine, but that white pine is often present in the forests containing the plant. The Service recommends that future conclusions be based on field surveys.

In general, the Service can accept the preliminary determination that the project would have no effect on the RCW, Saint Francis satyr (*Neonympha mitchellii francisci*), pondberry (*Lindera melissifolia*), rough-leaved loosestrife, Michaux’s surnac, and American chaffseed. Records available to the Service indicate that none of the listed species of Cumberland County have been reported to occur near the project site.

Table 5 of the NRTR shows that two mussels designated as FSC have potential habitat within the project area. These are the Atlantic pigtoe (*Fusconaia masoni*) and yellow lampmussel (*Lampsilis cariosa*). The Service recommends that effective erosion and sedimentation control be used during all construction to minimize any impacts to these mussel species.

B-4205 (Montgomery County, Bridge No. 133 on SR 1310 [Lovejoy Road] over Dumas [Doomas] Creek)

Some documents for the project state that the bridge crosses Doomas Creek while other documents give the name as Dumas Creek. We will use the latter in our comments and future planning document should indicate the correct name.

The NRTR considers three alternatives, a new structure immediately downstream (Alternative 1), a new structure immediately upstream (Alternative 2), and replacement at the existing location with offsite detours on existing roads (Alternative 3). Table 2 (p. 12) presents impacts to jurisdictional water and wetlands. While there are only minor differences in impacts to wetlands, Alternative 1 has much greater permanent impacts to Dumas Creek (232 feet) versus the 32 feet for both Alternatives 2 and 3. The Service does not support Alternative 1 and would recommend Alternative 3.

The NRTR presents a biological conclusion for three federally listed animals and two plants. All conclusions are that the project would have no effects on these species. The conclusions for the three animals, the bald eagle (*Haliaeetus leucocephalus*), eastern cougar (*Felis concolor cougar*), and RCW were based on the absence of suitable habitat or, in the case of the cougar, the absence of recent evidence that the species exists in the area. The conclusions for the two plants, Schweintz’s sunflower (*Helianthus schweinitzii*) and smooth coneflower (*Echinacea laevigata*) were based on field surveys which appear adequate. Occurrence data presently available to the Service indicate that the species most likely to occur near the project are

Schweintz's sunflower and Carolina creekshell (*Villosa vaughaniana*), a FSC. The NCDOT should carefully monitor the project area prior to construction to ensure that Schweintz's sunflower does not colonize the area.

Table 4 of the NRTR shows that two mussels designated as FSC have potential habitat within the project area. These are the Atlantic pigtoe (*Fusconaia masoni*), Brook floater (*Alasmidonta varicosa*), Savannah lilliput (*Toxolasma pullus*), and Carolina creekshell. The Service recommends that effective erosion and sedimentation control be used during all construction to minimize any impacts to these mussels species.

B-4273 (Scotland/Hoke Counties, Bridge No. 47 On US 401 over the Lumber River)

The NRTR considers two alternatives: replacement at a new location, approximately 70 feet upstream of the existing structure (Alternative 1) and replacement at the same location (Alternative 2). Table 1 indicates that Alternative 2 would have less impacts on important plant communities such as cypress-gum swamp and coastal plains bottomland hardwoods. Table 2 shows that Alternative 2 would have less impacts (2.46 acres) on jurisdictional wetlands than Alternative 1 (4.45 acres). Based on these data, the Service considers Alternative 2 to be the least damaging to fish and wildlife habitat in the project area.

Table 3 accurately reflects the federally protected species known to occur in Scotland and Hoke Counties. The determinations that the project would have no effect on four species (RCW, Saint Francis' satyr, rough-leaved loosestrife, and American chaffseed) based on an absence of suitable habitat appear accurate. The systematic surveys for two plants with potential habitat, Canby's dropwort (*Oxypolis canbyi*) and Michaux's sumac, did not find these species and present sufficient evidence that the species do not occur in the project area in June 2001. Occurrence data available to the Service indicate that no Federally protected species have been reported in the project area.

The Service appreciates the opportunity to comment on these projects. Please continue to advise us of the progression of the planning process, including your official determination of the impacts of these bridge replacements. If you have any questions regarding these comments, please contact Howard Hall at 919-856-4520, Ext. 27.

Sincerely,



Garland B. Pardue, Ph.D.
Ecological Services Super-visor

cc: Ted Bisterfeld, USEPA, Atlanta, GA
David Timpy, USACE, Wilmington NC
John Hennessy, NCDWQ, Raleigh, NC
David Cox, NCWRC, Northside, NC

CONCURRENCE FORM FOR PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Project Description: Replace Bridge No. 81 on SR 1728 over Gum Log Creek

On 04/12/2002, representatives of the

- North Carolina Department of Transportation (NCDOT)
- Federal Highway Administration (FHWA)
- North Carolina State Historic Preservation Office (HPO)
- Other

Reviewed the subject project at

- Scoping meeting
- Historic architectural resources photograph review session/consultation
- Other

All parties present agreed

- There are no properties over fifty years old within the project's area of potential effects.
- There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the property identified as Properties 1-14 is considered not eligible for the National Register and no further evaluation of it is necessary.
- There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- There are no historic properties affected by this project. (Attach any notes or documents as needed)

Signed:

Richard Lunn 16 APRIL 2002
 Representative, NCDOT Date

Mark C. Damm 4/16/02
 FHWA, for the Division Administrator, or other Federal Agency Date

Claydon Brown 4-16-02
 Representative, HPO Date

David Wood 5/2/02
 State Historic Preservation Officer Date

If a survey report is prepared, a final copy of this form and the attached list will be included.



Vance

North Carolina Department of Cultural Resources
State Historic Preservation Office

David L. S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

November 5, 2001

MEMORANDUM

TO: William D. Gilmore, Manager
Project Development and Environmental Analysis Branch
Division of Highways
Department of Transportation

FROM: David Brook *for David Brook*

SUBJECT: Bridge No. 81 on SR 1728 over Gum Log Creek, B-4093,
Cumberland County, ER 02-7903

Thank you for your letter of September 26, 2001, concerning the above project.

We have conducted a review of the project and are aware of no historic resources, which would be affected by the project. Therefore, we have no comment on the project as proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

DB:kgc

7

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 • 733-8653
Restoration	515 N. Blount St, Raleigh, NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 • 715-4801
Survey & Planning	515 N. Blount St, Raleigh, NC	4618 Mail Service Center, Raleigh 27699-4618	(919) 733-4763 • 715-4801



North Carolina Department of Crime Control and Public Safety
Division of Emergency Management

Michael F. Easley, Governor

Bryan E. Beatty, Secretary

October 19, 2001

Mr. William D. Gilmore, P.E.,
Manager of the Project Development and Environmental Analysis Branch
Division of Highways
1549 Mail Service Center
Raleigh, NC 27699-1549

OCT 22 2001

Subject: **RE: Bridge Replacement Projects**

Dear Mr. Gilmore:

Thank you for your letters dated September 26, 2001 regarding the review of nine bridge replacement projects. The North Carolina Division of Emergency Management has reviewed the proposed projects and would like to provide comments to the Department of Transportation.

My staff has reviewed the Flood Insurance Rate Maps (FIRMs) for your project areas. The majority of these projects are located in Special Flood Hazard Areas, also know as the 100-year floodplain. Please ensure that the proposed projects do not cause an increase in the Base Flood Elevation (BFE) in these areas and that they comply with Nation Flood Insurance Program guidelines.

Projects Located in Special Flood Hazard Areas (100-year floodplain)

- B-4009, Bridge No. 33 in Anson County - Zone A
- B-3830, Bridge No. 363 in Columbus County - Zone A
- B-4205, Bridge No. 133 in Montgomery County - Zone A
- B-4273, Bridge No. 37 in Scotland County - Zone A
- B-3908, Bridge No. 246 in Stanly County - Zone A
- B-3909, Bridge No. 99 in Stanly County - Zone A
- B-4276, Bridge No. 33 in Stanly County - Zone A5

Projects Not Located in Special Flood Hazard Areas (100-year floodplain)

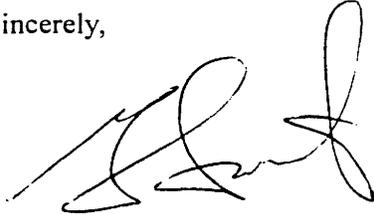
- B-4093, Bridge No. 81 in Cumberland County - Zone B (500-year floodplain)
- B-3680, Bridge No. 2 in Moore County - Zone X (500-year floodplain)

The Division of Emergency Management does not oversee the routing of Emergency Response Units on a day-to-day basis. However, utilizing off-site detour routes has the potential to increase response times of these units, especially if alternate routes are not available. Your agency should contact local emergency management officials or the local representatives responsible for roadways. NCEM would

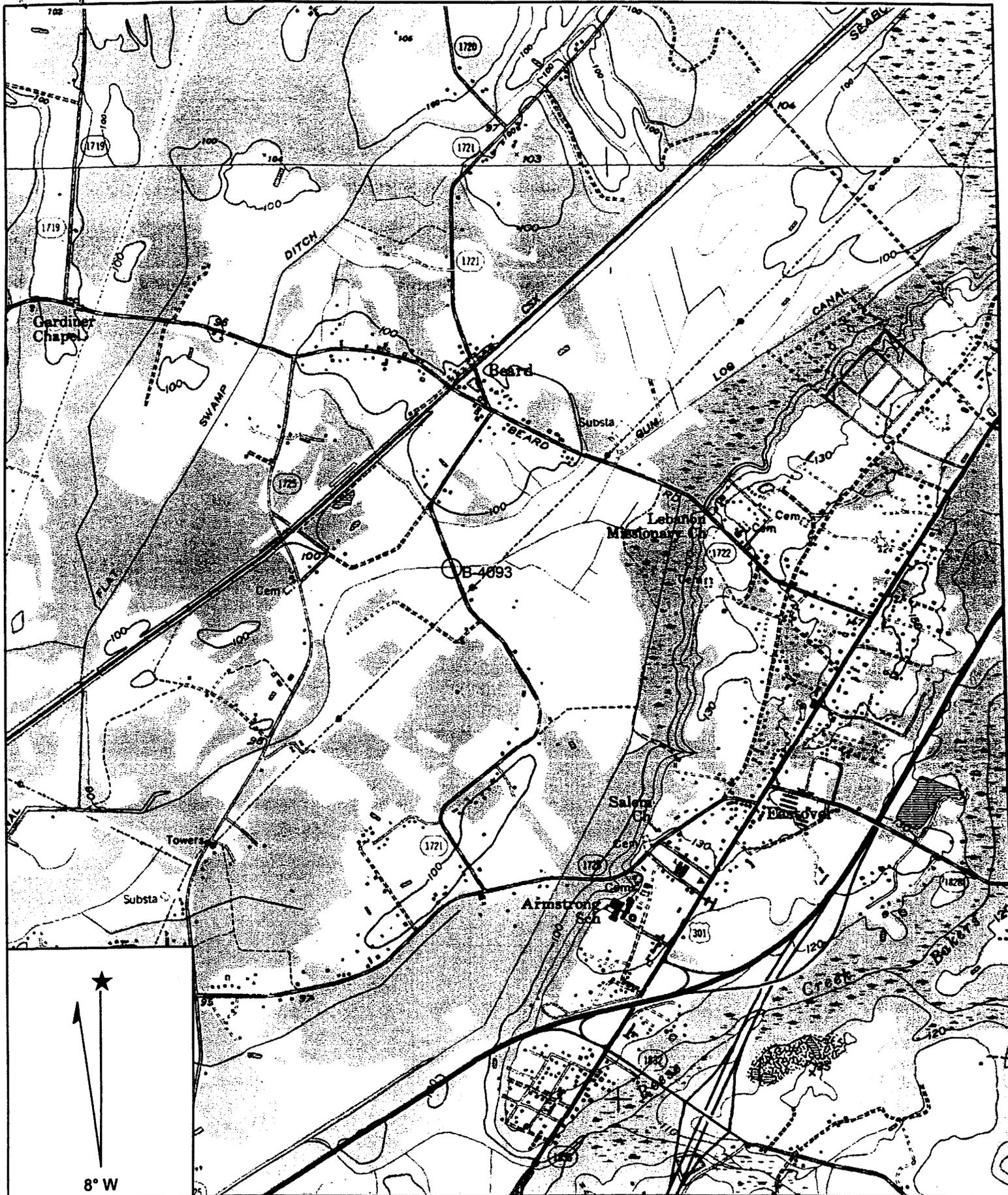
also like to advise that you pay close attention to roadways that have been identified as evacuation routes and the potential impacts your projects may have on evacuation travel.

If you have any further questions or need additional information, please do not hesitate to contact Steve Garrett at (919) 715-8000, extension 349.

Sincerely,

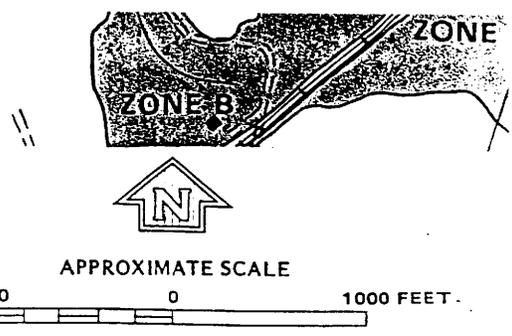
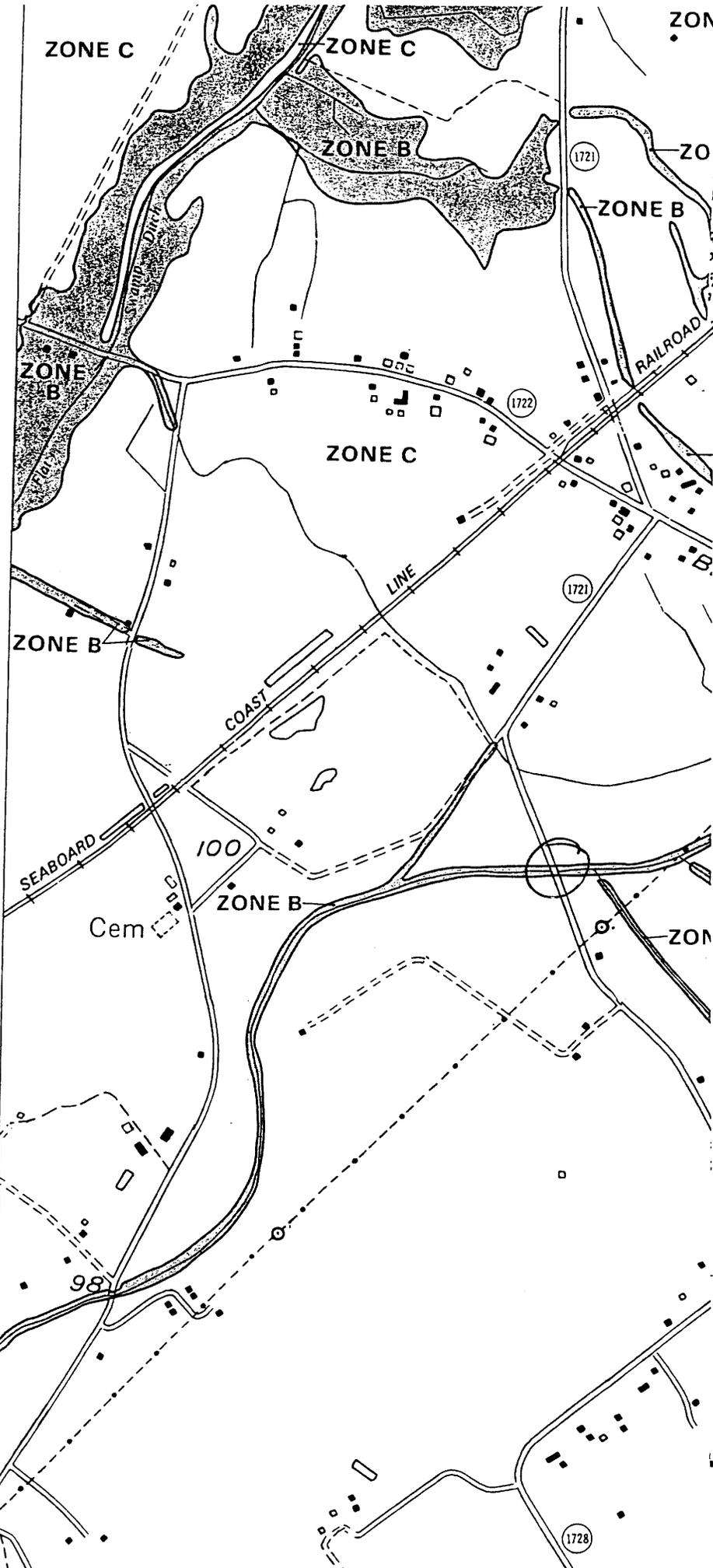
A handwritten signature in black ink, appearing to read 'Gavin Smith', with a large, stylized flourish at the end.

Gavin Smith, Ph.D.
Assistant Director, Hazard Mitigation
North Carolina Division of Emergency Management



Name: VANDER
 Date: 10/10/2001
 Scale: 1 inch equals 2000 feet

Location: 17 700748 E 3886778 N
 Caption: Cumberland County, B-4093
 Bridge no. 81 on SR1728 over Gum Log Canal, L=104ft.
 W=27.3ft. yr built 1963



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

**CUMBERLAND COUNTY,
NORTH CAROLINA**
(UNINCORPORATED AREAS)

PANEL 130 OF 295
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
370076 0130 B

EFFECTIVE DATE:
FEBRUARY 17, 1982



Federal Emergency Management Agency



John M. Gillis, Jr., Chair
Cumberland County

Clifton McNeill, Jr., Vice-Chair
Cumberland County
David Averette,
Cumberland County
Dallas Byrd, Town of Stedman
Charles C. Morris,
Town of Linden



COUNTY of CUMBERLAND

Cumberland County Joint Planning Board

Barry A. Warren
Planning Director

Joe W. Mullinax,
Town of Spring Lake
Jerry Olsen,
Wade, Falcon
& Godwin
Dr. Marion Gillis-Olson,
Cumberland County

October 11, 2001

William D. Gilmore, PE
Project Development and Analysis Branch
NC Department of Transportation
1549 Mail Service Center
Raleigh NC 27699-1549

OCT 15 2001

Subject: B-4093, Bridge No. 81 on SR 1728 over Gum Log Creek

Dear Mr. Gilmore:

Middle Road (SR 1728) is on the Fayetteville Urbanized Area Thoroughfare Plan as a Major Thoroughfare with a recommended Cross Section "D" (five lanes, curb and gutter) on a 90-foot right-of-way. We request that the new bridge accommodate this cross section. In addition, this road is on our Bicycle and Pedestrian Plan, and we are also requesting a walkway on one side.

A copy of the Flood Insurance Rate Map (FIRM) is included for your information. Cumberland County's Emergency Management Director has reviewed the proposal with the County Fire Marshall, and they see no problem with either an on- or off-site detour.

If you need additional information, please call me at (910) 678-7606.

Sincerely,

A handwritten signature in black ink, appearing to read "Barry A. Warren".

Barry A. Warren
Planning Director

Attachment

cc: J. Lee Warren, Jr., County Board of Commissioners Chair
Robert Stanger, PE, County Engineer
Doc Nunnery, County Emergency Management Director

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

**CUMBERLAND COUNTY,
NORTH CAROLINA**
(UNINCORPORATED AREAS)

PANEL 125 OF 295

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
370076 0125 B

EFFECTIVE DATE:
FEBRUARY 17, 1982



Federal Emergency Management Agency



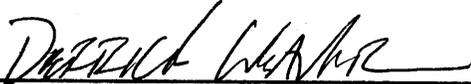
JOINS PANEL 165

Cumberland County
SR 1728
Bridge No. 81 over Gum Log Creek
Federal-Aid Project: BRZ-1728(1)
State Project: 8.2443501
T.I.P. No. B-4093

Addendum to
Categorical Exclusion
US Department of Transportation
Federal Highway Administration
and
NC Department of Transportation
Division of Highways

Approved

2/27/06
Date



for Gregory J. Thorpe, PhD, Director
Project Development & Environmental Analysis Branch
North Carolina Department of Transportation

3/1/06
Date



for John F. Sullivan, III, P.E.
Division Administrator,
Federal Highway Administration

Cumberland County
SR 1728
Bridge No. 81 over Gum Log Creek
Federal-Aid Project: BRZ-1728(1)
State Project: 8.2443501
T.I.P. No. B-4093

Addendum to
Categorical Exclusion
US Department of Transportation
Federal Highway Administration
and
NC Department of Transportation
Division of Highways

February 2006

Document Prepared by

Wilbur Smith Associates, Inc.

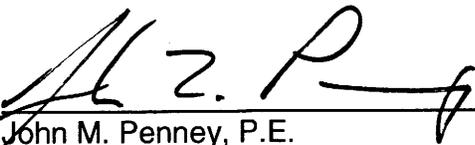


David L. Wilver, P.E.
Project Manager



for the

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



John M. Penney, P.E.
Contract Management Group Leader

PROJECT COMMITMENTS

Cumberland County
SR 1728
Bridge No. 81 Over Gum Log Creek;
Federal Aid Project No.: BRZ-1728(1)
State Project No.: 8.2443501
TIP No.: B-4093

In addition to the standard Nationwide Permit #33 and #23 Conditions, the General Nationwide Permit Conditions, Section 404 Individual Permit (IP) Special Conditions, Section 401 Water Quality Certification (WQC) Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Commitments Developed Through Project Development and Design

All commitments developed during the project development and design phase have been incorporated into the design and were standard commitments. Current status, changes, or additions to the project commitments as shown in the environmental document for the project are printed in *italic* font.

Roadway Design/Roadside Environmental/Division 6 Construction

Ensure that sediment and erosion control measures are not placed in wetlands.

This standard will be implemented during construction to the best ability of the Department in coordination with existing standards and laws.

Roadway Design/ Division 6 Construction

Borrow/waste areas should avoid wetlands to the maximum extent practicable. Prior to the approval of any borrow/waste site in a wetland, the contractor must obtain all necessary permits.

This standard will be used during design and will be implemented during construction of the project.

Division 6 Construction

Disturbance of the stream channels must be limited to only what is necessary to perform the bridge demolition/removal and construction of the replacement structure and what is permitted. Heavy equipment must be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into the stream.

This environmental commitment will be implemented during construction of the project.

Division 6 Construction

All work shall be performed during low flow conditions

This environmental commitment will be implemented during construction of the project.

PROJECT COMMITMENTS

PDEA

A systematic survey of all potentially suitable habitat for Michaux's sumac was conducted by Environmental Services, Inc. biologists in June 2001. No individuals of Michaux's sumac were observed during the survey. A re-survey will be conducted between the spring and fall of 2004, during the survey window, within the project limits to determine if any member of the species is present.

This commitment will be implemented prior to construction of the project.

Addendum

**Cumberland County
SR 1728
Bridge No. 81 over Gum Log Creek
Federal-Aid Project: BRZ-1728(1)
State Project: 8.2443501
T.I.P. No. B-4093**

III. ALTERNATIVES

A. Project Description

The recommended Bridge length is based on a preliminary hydraulic analysis in conjunction with a field reconnaissance of the site, the proposed replacement structure is a bridge approximately 120 feet (36.6 m) long. The grade of the roadway will be approximately the same as the existing road. A minimum grade of three tenths (0.3) of a percent should be maintained to facilitate deck drainage. The length of the proposed bridge and the recommended roadway elevation may be adjusted (increased or decreased) to accommodate design floods as determined in the final hydrologic study and hydraulic design.

B. Build Alternatives (Figure 2)

The alternative for replacing Bridge No. 81 is described below.

Alternate 1 (Preferred) includes replacement of the existing 104 foot (ft) [31.7 meter (m)] structure with a new structure in the same location as the existing structure. The proposed structure will consist of two 12 foot travel lanes and two 3 foot shoulders for a total clear roadway width of 30 feet (9.2 m). The new structure will be approximately 120 ft (36.6 m) in length and 33 ft (10.1 m) wide. The approach work will extend from approximately 270 ft (82 m) north to approximately 270 ft (82 m) south of the existing structure. Traffic will be maintained with an off-site detour on existing roads (Figure 2A). The off-site detour route will utilize SR 1730, SR 1725, US 301/I-95 Business and SR 1728.

C. Alternatives Eliminated From Further Study

Alternate 2 includes replacement of the existing approximately 104 ft (31.7 m) two lane bridge with a new two lane structure approximately 20 ft (6 m) upstream of the existing structure. The new structure will be approximately 120 ft (36 m) in length. The approach work will extend from approximately 820 ft (250 m) north to approximately 900 ft (274 m) south of the existing structure. The total project length is approximately 1840 ft (560 m) in length. Traffic will be maintained on the existing structure during construction.

No Action Alternate The “do-nothing” alternative would eventually necessitate removal of the bridge effectively removing the westbound section of HWY 74 from traffic service. Investigation of the existing structure by the Bridge Maintenance Unit indicates the rehabilitation of the old bridge is not feasible due to its age and deteriorated condition.

D. Preferred Alternative

Alternate 1 is the preferred alternate. It proposes replacement of the existing 104 foot (ft) [31.7 meter (m)] structure with a new structure in the same location as the existing structure. Alternate 1 was selected because of fewer impacts to streams, better horizontal alignment, and lower construction costs. NCDOT Division 6 Engineer concurs with the preferred alternative and off-site detour route.

IV. ESTIMATED COST

Table 1: Estimated Cost

	Alternate 1 (Preferred)	Alternate 2
Structure Removal (Existing)	\$35,385	\$35,385
Structure (Proposed)	\$324,000	\$324,000
Roadway Approaches	\$405,538	\$729,696
Miscellaneous and Mobilization	\$185,077	\$300,919
Engineering and Contingencies	\$150,000	\$210,000
ROW/Const. Easement/Utilities	\$58,000	\$59,875
Total	\$1,158,000	\$1,659,875

V. NATURAL RESOURCES

D. Biotic Resources

2. Potential Impacts to Vegetation Communities

Potential impacts to vegetation communities are estimated based on the area of each community present within the proposed construction limits provided by Wilbur Smith Associates. A summary of potential vegetation community impacts is presented in Table 3 in acres (ac) and hectares (ha).

Table 3. Potential Impacts to Vegetation Communities.

VEGETATION COMMUNITY	Potential Impacts Acres (hectares)			
	Alternative 1 (Preferred)		Alternative 2	
	Impacts	Temp. Construction Impacts ^a	Impacts	Temp. Construction Impacts ^a
Mesic Mixed Hardwood Forest	0.60 (0.24)	0.03 (0.01)	0.12 (0.05)	0.14 (0.06)
Agricultural Land	0.17 (0.07)	0.38 (0.15)	1.49 (0.60)	0.25 (0.10)
Maintained/Disturbed Land	0.22 (0.09)	0.90 (0.36)	0.97 (0.39)	0.47 (0.19)
Total:	0.99 (0.40)	1.31 (0.52)	2.58 (1.04)	0.86 (0.35)
Total For Alternative^b:	2.30 (0.92)		3.44 (1.39)	

^a Temporary construction impacts are based on the portion of the impacts not included in the construction limits for the permanent structure.

^b Totals for vegetation communities do not include the open water area attributed to Gum Log Canal impervious road surface.

Potential impacts associated with a bridge replacement are generally limited to narrow strips adjacent to the existing bridge structure and roadway approach segments. The two alternatives presented above minimize potential impacts to the adjacent Mesic Mixed Hardwood Forest. Alternative 2 concentrates potential impacts in the maintained/disturbed land and has the least amount of potential impacts to Mesic Mixed Hardwood Forest. This alternative calls for the replacement of the existing structure, which will reduce permanent impacts to natural plant communities and limit community fragmentation. Alternative 1 has the least amount of total potential impacts while minimizing potential impacts to agriculture lands through the reduction in the amount of roadway approach work required.

E. Special Topics

2. Potential Impacts to Waters of the United States

Potential impacts to wetlands and open water areas are estimated based on the amount of each jurisdictional area within the proposed construction limits. Open water areas of Gum Log Canal (R2UB1) are included in this table, although impacts are not expected due to the use of channel-spanning structures. During Bridge Removal Procedures, NCDOT's BMP's will be utilized, including Erosion Control Measures. Therefore it is anticipated that removing the existing bents will result in no impact to surrounding surface waters. A summary of potential jurisdictional impacts is presented in Table 4 in acres and hectares or linear feet and meters, as appropriate.

Table 4. Potential Impacts to Jurisdictional Areas.

JURISDICTIONAL AREAS	Potential Wetland Impacts Acres (hectares)			
	Alternative 1 (Preferred)		Alternative 2	
	Impacts	Temporary Construction Impacts ^a	Impacts	Temporary Construction Impacts ^a
R2UB1 (Gum Log Canal)	0.02 (0.01)	0.08 (0.03)	0.02 (0.01)	0.08 (0.03)
R4UB2 (UT Gum Log Canal)	0.0	0.0	0.0	0.0
Total:	0.02 (0.01)	0.08 (0.03)	0.02 (0.01)	0.08 (0.03)
Total Wetland Impacts:	0.10 (0.04)		0.10 (0.04)	
	Potential Stream Impacts Linear feet (meters)			
Gum Log Canal	40 (12)	0	35 (11)	125 (38)
UT Gum Log Canal	0	0	0	0
Total:	40 (12)	0	35 (11)	125 (38)
Total Stream Impacts:	40 (12)		160 (49)	

^a Temporary construction impacts are based on the portion of the impacts not included in the construction limits for the permanent structure.

Both alternatives avoid potential impacts to UT Gum Log Canal. Alternative 1 and Alternative 2 each have the same amount of potential impacts, 0.02 ac (0.01 ha). Alternative 1 has the least amount of temporary impacts. Alternative 2 minimizes temporary impacts for Gum Log Canal to 125 linear ft (38 m). Both alternatives include use of a channel spanning structure that would avoid impacts to Gum Log Canal. The current alternatives will result in no wetland impacts associated with construction.

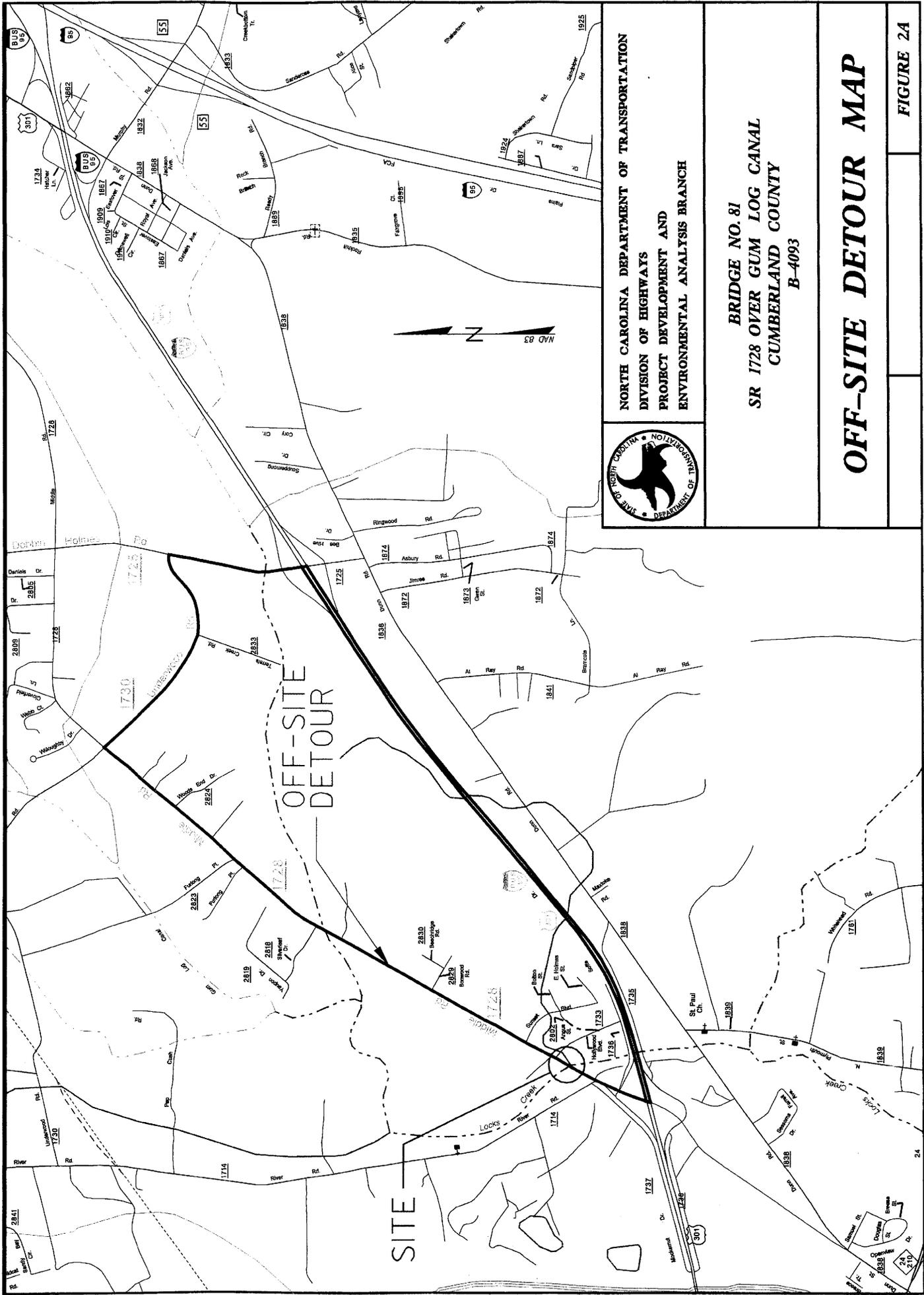


THE ILLINOIS DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
CONSTRUCTION SERVICES BRIDGE

B-4105
CLIMBER AND COUNTY
BRIDGE #81 OVER GUM LOG CREEK

JANUARY 2005 NOT TO SCALE

FIGURE 2



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 PROJECT DEVELOPMENT AND
 ENVIRONMENTAL ANALYSIS BRANCH

BRIDGE NO. 81
 SR 1728 OVER GUM LOG CANAL
 CUMBERLAND COUNTY
 B-4093

OFF-SITE DETOUR MAP

SITE

OFF-SITE
 DETOUR

