

SF

min Brg = 96'

Project# SF-230013

TIP# _____

Let Date _____

WBS# _____

PREDESIGN-PRESURVEY REPORT

County ColumbusBridge# 13Road# NC 410Stream Beaver dam Swamp

Type Of Request: POC Force Account TIP NCMA

Date _____ Name EAKpugu Assigned To _____

Checked By _____

Prior Survey Date N/A (attach copy of prior survey)

Study By Scour Section _____

Flood Zone Yes Detail Study Limited Date June 2, 2006 Panel# 0148

B.M. Info _____

Quad Map CHAD Bourn Drainage Area 7.6 Sq. mi From USGS-NC stream stat, FIS
Q25 840 Q50 1045 Q100 1270 Method _____USGS - rural regression eqn, Region 4 - Coastal plain

EXISTING BRIDGE INFORMATION

FIS Q₁₀₀ = 1410 cfsLocation 0.5 mi S Jct SR 1004Average Daily Traffic 4400 (2010)Length 41' Bed- To Crown _____ Water Depth 9'Type Structure RC Floor on Cont. 1-beamsType Spans 1 @ 20', 1 @ 20'6 Cont.Upstream Structure Brg # 115Location 0.2 mi S Jct SR 1004Bed- To Crown 12' Prior Survey _____Downstream Structure Brg 123Location 0.3 mi N Jct SR 1324Bed- To Crown 9' Prior Survey _____

SCS Watershed _____

ENVIRONMENTAL

Trout Stream No Anadromous Fish No Primary Nursery Area NoHigh Quality Waters No Nutrient Sensitive Waters NoNear Water Supply Intake No CAMA County NoStream Classification C, SwDENR River Basin Info. Lumber



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRIDGE MANAGEMENT UNIT

ATTENTION TEMPORARY REPAIRS: ENCASED PILES / CRUTCH
BENTS

BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY COLUMBUS

BRIDGE NUMBER 230013

INSPECTION CYCLE 2 YRS

ROUTE NC410

ACROSS BEAVERDAM SWAMP

M.P. 0

LOCATION 0.5 MI S OF JCT SR1004

SUPERSTRUCTURE RC FLOOR ON CONTINUOUS I-BEAMS

SUBSTRUCTURE EBTS&IBT:RC CAPS/TIMBER PILES@7'4 CTS.

SPANS 1@20',1@20'6 CONT.

LONGITUDE 79° 48' 5.5"

LATITUDE 34° 15' 18.3"

PRESENT CONDITION FAIR

INVENTORY RATING

H5-01

INSPECTION DATE 08/10/2011

OPERATING RATING

H5-01

PRESENT POSTING Not Posted

PROPOSED POSTING

N.P.

COMPUTER UPDATE

8-25-11

ANALYSIS DATE

8-18-11

POSTING LETTER DATE

SUFFICIENCY RATING

OTHER SIGNS PRESENT NONE



LOOKING NORTH

SIGN NOTICE
ISSUED FOR

NUMBERED
REQUIRED

No WEIGHT LIMIT

No DELINEATORS

No NARROW BRIDGE

No ONE LANE BRIDGE

No LOW CLEARANCE

BRIDGE MANAGEMENT UNIT
DATA ON EXISTING STRUCTURE

Run Date: 08/25/2011

COUNTY : COLUMBUS	DIV : 6	DIST : 3	STRUCTURE NUMBER : 230013	LENGTH : 41 FEET
ROUTE CARRIED : NC410		FEATURE INTERSECTED : BEAVERDAM SWAMP		
LOCATED : 0.5 MI S OF JCT SR1004		BRIDGE NAME :		CITY :
FUNC. CLASS : 07	SYST.ON : FA	SYST.UNDER : NFA	ADT & YR : 4400 2010	RAIL TYPE : LT 181 RT 181
BUILT : 1948	BY : BMU	PROJ : 4.6420015	FED.AID PROJ :	DESIGN LOAD : HS 20
REHAB :	BY : DBM	PROJ :	ALIGNMENT : TAN. 90	LANES : ON 2 UNDER
NAVIGATION : VC 0.0 FT HC 0.0 FT		HT. CRN. TO BED : 14 FT		WATER DEPTH : 9 FT
SUPERSTRUCTURE : RC FLOOR ON CONTINOUS I-BEAMS				
SUBSTRUCTURE : EBTS&IBT:RC CAPS/TIMBER PILES@7'4 CTS.				
SPANS : 1@20',1@20'6 CONT.				
BEAMS OR GIRDERS : 6 LINES W14X34 CONT.I-BEAMS@4'8 CENTERS				
FLOOR : 6 RC/NO AWS	ENCROACHMENT :		DECK (OUT TO OUT) : 25.3 FT	
CLEAR ROADWAY : 24.0 FT	BETWEEN RAILS : 26.0 FT		SIDEWALK OR CURB : LT 1.0 FT RT 1.0 FT	
VERT.CL.OVER : 99 FT 99 IN	VERT.CL.UNDER : 00 FT 00 IN		HOR.CL.UNDER : 0.0 FT	
INV.RTG. : HS-1	OPE.RTG. : HS-1	CONTR.MEMBER : BEAM INT.	POSTED : SV TTST	DATE 09/02/2008
SYSTEM : Primary N.C. Route			GREEN LINE ROUTE : N	
2ND OPENING :		3RD OPENING :		4TH OPENING : 5TH OPENING :
REMARKS :				

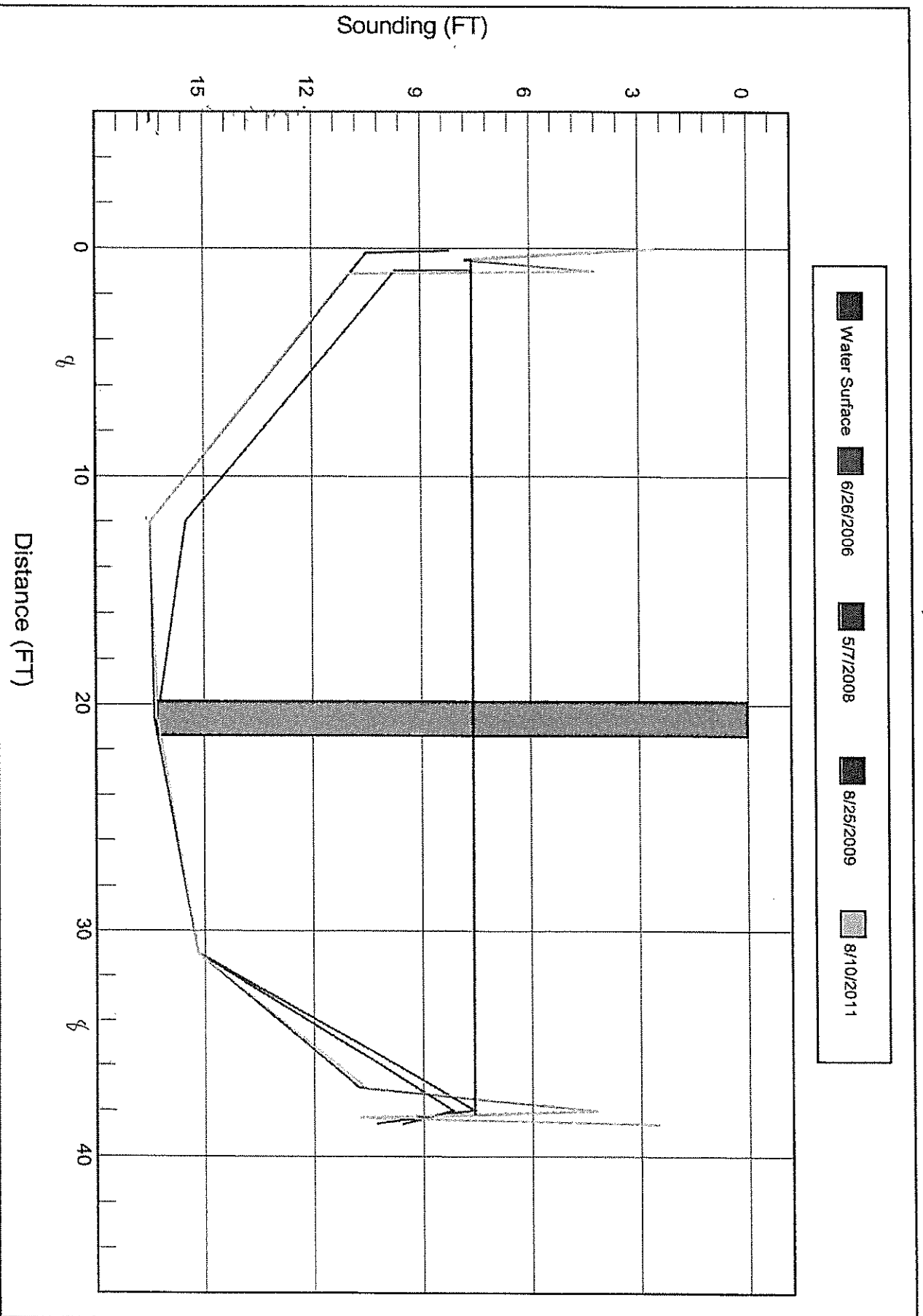
Bridge: 230013

County COLUMBUS

Date: 08/10/2011

Top of Rail = 0 FT (Sounding)

STREAMBED PROFILE (Downstream)



$$13.5 \times 1.5 = 20.25 \times 2 = 40.5 + 20 + 36 = 96.5$$

Section 5.0 – Engineering Methods

Table 7—Summary of Discharges

Flooding Source	Location	Drainage Area (square miles)	Discharges (cfs)			
			10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Beaverdam Swamp (continued)	Approximately 1,050 feet upstream of NC HWY 410	7.80	*	*	1,410	*
	Approximately 1,150 feet upstream of NC HWY 410	5.10	*	*	1,110	*
	Approximately 1,250 feet upstream of Chadbourn Clarendon Road	3.54	*	*	900	*
	Approximately 1,350 feet upstream of Chadbourn Clarendon Road	3.16	*	*	840	*
Beaverdam Creek	At the confluence with Waymans Creek	10.9	*	*	1,805	*
	Approximately 0.12 mile downstream of Highway 11 crossing	10.1	*	*	1,736	*
	Approximately 0.17 mile downstream of Bar Pitt Road crossing	9.3	*	*	1,652	*
Big Branch	At the confluence with Livingston Creek	9.6	*	*	1,687	*
	Approximately 160 feet upstream of confluence with Mill Branch	7.7	*	*	1,482	*
	Approximately 0.19 mile downstream of Delco-Prosper Road crossing	6.9	*	*	1,392	*
	At the confluence with Bay Branch	5.9	*	*	1,280	*

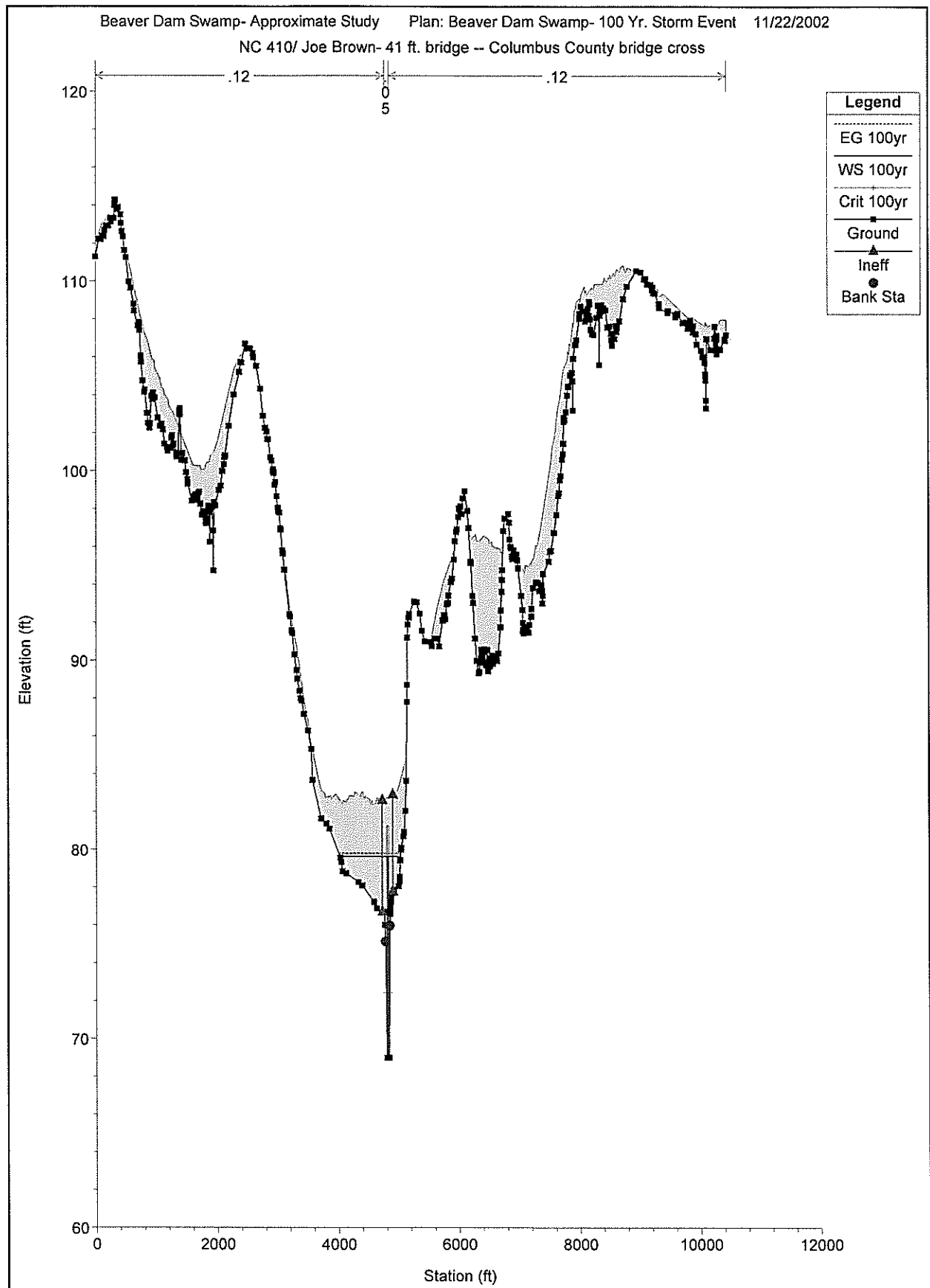
Section 5.0 – Engineering Methods

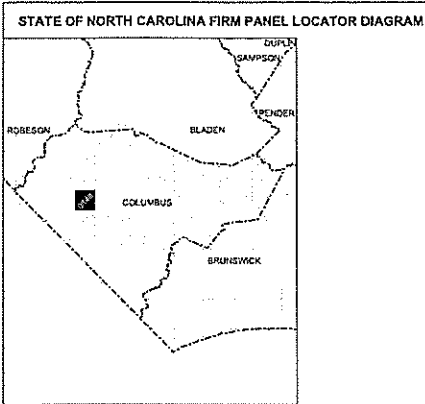
Table 10—Limited Detailed Flood Hazard Data

Cross Section ¹	Stream Station ²	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width ³ (feet)
BEAVERDAM SWAMP (continued)				
537	53,659	1,410	77.6	5
544	54,355	1,410	78.1	5
548	54,818	1,410	78.5	5
553	55,261	1,410	78.9	5
557	55,744	1,410	79.4	5
563	56,339	1,410	79.6	5
565	56,501	1,410	79.8	5
570	56,993	1,410	80.1	5
575	57,461	1,410	81.1	5
578	57,829	1,110	81.7	5
584	58,379	900	82.3	5
589	58,892	900	82.7	5
594	59,412	900	83.3	5
599	59,890	900	83.9	5
603	60,287	900	84.2	5
607	60,718	900	84.8	5
612	61,209	900	85.7	5
617	61,693	900	86.7	5
622	62,175	900	87.4	5
626	62,644	900	88.0	5
631	63,092	900	88.6	5
635	63,534	900	88.9	5
636	63,595	900	89.4	5
636	63,597	900	89.3	5
636	63,602	900	89.4	5
637	63,652	900	89.8	5
641	64,127	900	90.5	5
646	64,578	900	91.4	5
651	65,071	840	92.3	5
656	65,575	800	92.9	5
660	65,954	800	93.6	5
663	66,312	800	94.6	5
BIG BRANCH				
004	413	1,687	23.7***	450 / 40
011	1,081	1,687	23.7***	36 / 34
011	1,123	1,687	23.7***	36 / 34
020	2,000	1,687	23.7***	288 / 80
024	2,377	1,687	23.7***	325 / 157
030	3,000	1,687	23.7***	193 / 108
034	3,443	1,687	23.7***	89 / 188
040	4,000	1,687	23.7***	207 / 233
044	4,410	1,687	24.0	278 / 51
051	5,063	1,482	24.7	228 / 93

ZON







DATUM INFORMATION

The projection used in the preparation of this map was the North Carolina State Plane (NAD83). The horizontal datum was the North American Datum of 1983 (NAD 83). Differences in datum, ellipsoid, projection, or Universal Transverse Mercator zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdictional boundaries. These differences do not affect the accuracy of this FIRM. All coordinates on this map are in U.S. Survey Feet, where 1 U.S. Survey Foot = 1200/9937 Meters.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. An average offset between NAVD 88 and the National Geodetic Vertical Datum of 1929 (NGVD 29) has been computed for each North Carolina county. This offset was then applied to the NGVD 29 flood elevations that were not revised during the creation of this statewide formal FIRM. The offsets for each county shown on this FIRM panel are shown in the vertical datum offset table below. Where a county boundary and a flooding source with unrevisted NGVD 29 flood elevations are coincident, an individual offset has been calculated and applied during the creation of this statewide formal FIRM. See Section 6.1 of the accompanying Flood Insurance Study report to obtain further information on the conversion of elevations between NAVD 88 and NGVD 29. To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the North Carolina Geodetic Survey at the address show below. You may also contact the Information Services Branch of the National Geodetic Survey at (201) 713-3242, or visit its website at: www.ngs.noaa.gov.

North Carolina Geodetic Survey
121 West Jones Street
Raleigh, NC 27601
(919) 733-3336
www.ncgs.noaa.gov

County	Vertical Datum Offset (ft)
COLUMBUS	-1.04

Example: NAVD 88 = NGVD 29 + (-1.04)



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AD, AR, A99, VE, and V. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding; Base Flood Elevations determined).
ZONE AD Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being retained to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE D Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities
Base Flood Elevation line and value, elevation in feet
Base Flood Elevation value where uniform within zone; elevation in feet
Cross section line
Transverse line
Geographic coordinates (referenced to the North American Datum of 1983 (NAD 83))
4276 MW
1:477,500 FEET
BM5510
BM5510
NAD 83
River Mile

Referenced to the North American Vertical Datum of 1988

GRID NORTH
MAP SCALE 1" = 1000' (1 : 12,000)
500 0 500 1000 FEET
500 0 500 1000 METERS

Cooperating Technical State

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

www.ncfloodmaps.com

NOTES TO USERS

This map is for use in administering the National Flood Insurance program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles, Floodway Data, Limited Detailed Flood Hazard Data, and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of regulatory floodways shown on the FIRM for flooding sources studied by detailed methods were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data for flooding sources studied by limited methods as well as non-encroachment widths for flooding sources studied by detailed methods are provided in the Flood Insurance Study report for the jurisdiction. The FIS report also provides instructions for determining a boundary width non-encroachment widths for flooding sources studied by limited methods.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.4 "Flood Protection Measures" of the Flood Insurance Study report for information on the flood control structures in the jurisdiction.

Base map information and geospatial data used to develop this FIRM were obtained from various organizations, including the participating local community(ies), state and federal agencies, and/or other sources. The primary base for this FIRM is aerial imagery acquired by Columbus County. The time period of collection for the imagery is 1997. Information and geospatial data supplied by the local community(ies) that met FEMA base map specifications were considered the preferred source for development of the base map. See geospatial metadata for the associated digital FIRM for additional information about base map preparation.

Base map features shown on this map, such as corporate limits, are based on the most up-to-date data available at the time of publication. Changes in the corporate limits may have occurred since this map was published. Map users should consult the appropriate community official or website to verify current conditions of jurisdictional boundaries and base map features. This map may contain roads that were not considered in the hydraulic analysis of streams where no new hydraulic model was created during the production of this statewide format FIRM.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each is located.

If you have questions about this map, or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at www.fema.gov.

An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at www.ncfloodmaps.com, or contact the FEMA Map Service Center at 1-800-358-9516 for information on all related products associated with this FIRM. The FEMA Map Service Center

MAP REPOSITORY

Refer to listing of Map Repositories on Map Index or visit www.ncfloodmaps.com

EFFECTIVE DATE OF FLOOD INSURANCE RATE MAP PANEL

JUNE 2, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

JUNE 2, 2006

For community map revision history prior to statewide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent, the North Carolina Division of Emergency Management, or the National Flood Insurance Program at the following phone numbers or websites.

NC Division of Emergency Management
Phone: 1-800-358-9516
Website: www.ncfloodmaps.com

National Flood Insurance Program
Phone: 1-800-358-9516
Website: www.fema.gov

PANEL 0148J

FIRM

FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 0148

(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

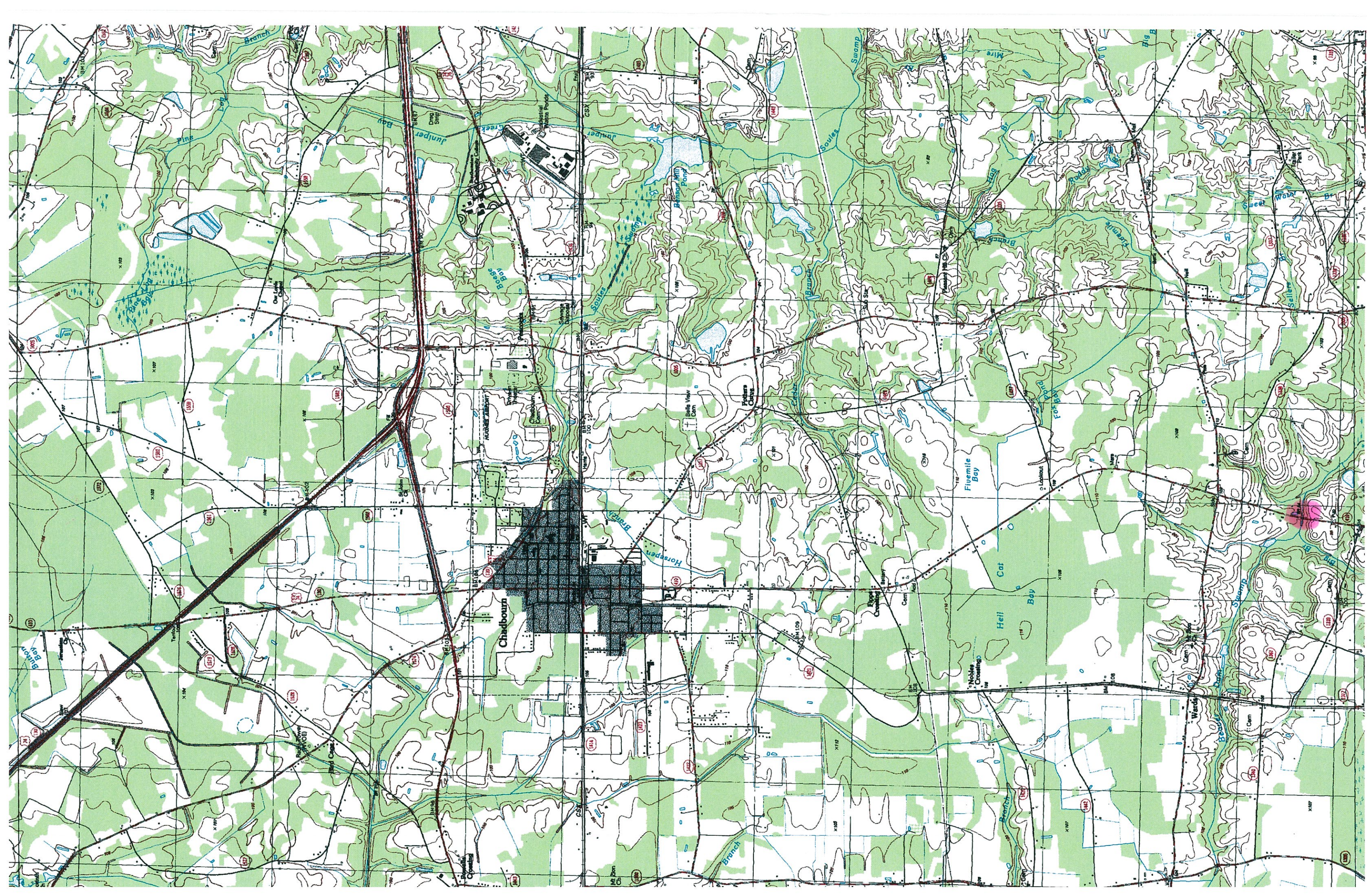
COMMUNITY	COUNTY	DATE	DATE
COLUMBUS	COLUMBUS	0148	0148

Notice to User: The Map Number shown below should be used when placing new orders. The Community Number shown above should be used on insurance applications for the subject community.

EFFECTIVE DATE
JUNE 2, 2006

MAP NUMBER
3720014800J

State of North Carolina
Federal Emergency Management Agency





North Carolina StreamStats

Basin Characteristics Report

Date: Fri May 17 2013 11:10:48 Mountain Daylight Time

NAD27 Latitude: 34.2549 (34 15 18)

NAD27 Longitude: -78.8188 (-78 49 08)

NAD83 Latitude: 34.2551 (34 15 18)

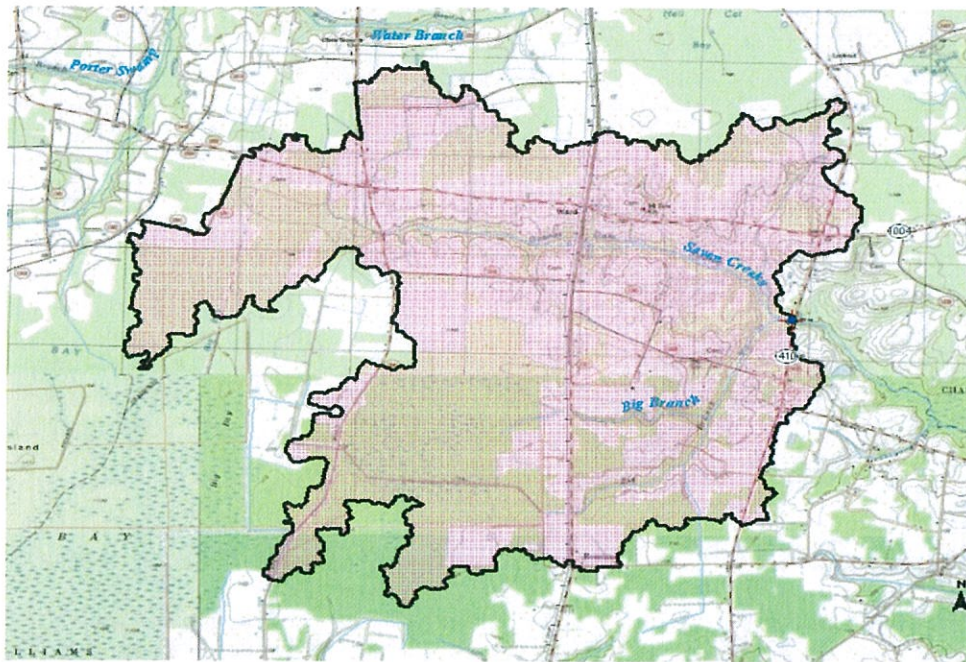
NAD83 Longitude: -78.8185 (-78 49 07)

Parameter	Value
Area in square miles	7.6
Percent of area covered by forest using 1992 NLCD	33.882
Percent of area covered by impervious surface 2006 NLCD	0.71
Difference in percent impervious between 2001 NLCD and 2006 NLCD	0.000
Mean annual precipitation in inches	50.6
Percent of area of protected Federal and State owned land	0
Percent of area covered by shrubland using 2001 NLCD	11.052
Percent of area covered by shrubland using 2006 NLCD	13.420
Percent of area in hydric soil 'A' defined by SSURGO	0.56
Percent of area in hydric soil 'B' defined by SSURGO	56.4
Percent of area in hydric soil 'C' defined by SSURGO	38.8
Percent of area in hydric soil 'D' defined by SSURGO	3.91
Percent of area covered by water using 1992 NLCD	0.096
Percent of area covered by water using 2001 NLCD	0.051
Percent of area covered by water using 2006 NLCD	0.051
Percent of area covered by wetland using 1992 NLCD	12.123
Percent of area covered by wetland using 2001 NLCD	12.209
Percent of area covered by wetland using 2006 NLCD	14.245



North Carolina StreamStats

StreamStats Print Page



Explanation

- ★ Global Watershed Point
- Stp1085 Point
- NCDOT Points
- ▲ Local Gages
- ▲ Gaging Station, Continuous Record
- ▲ Low Flow, Partial Record
- ▲ Peak Flow, Partial Record
- ▲ Peak and Low Flow, Partial Record
- ▲ Stage Only
- ▲ Low Flow, Partial Record, Stage
- ▲ Miscellaneous Record
- ▲ Unknown
- Local NHD2
- Longest Flow path
- Stream Grid
- Global Watershed
- Pilot Study Area
- Inupoly

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