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Subject:

Request for a Jurisdictional Determination of Waters of the United States within the project study area – NCDOT State Project No. 17BP.6.R.20, Bridge No. 75 on SR 1006 (MM Ray Road) over Big Branch, Columbus County, NC.

TRANSPORTATION

Dear Mr. Smith:

ARCADIS has performed a wetland delineation in the vicinity of Bridge No. 75 over Big Branch on SR 1006 (MM Ray Road) in Columbus, County, NC for the North Carolina Department of Transportation (NCDOT). This letter serves as the formal request for a Jurisdictional Determination. The study area extends from the bridge approximately 300 feet in each direction along the centerline of the road and approximately 100 feet up and down stream of the bridge. The study area consists of undeveloped, forested land and agriculture in the vicinity.

Date:

August 16, 2012

Contact:

Robert Lepsic

Phone:

919.854.1282

Email:

robert.lepsic@arcadis-us.com

Our ref:

NC609005.0616

Additional information pertaining to the proposed project is provided in the attached *Request for Jurisdictional Determination Information Package*. As previously stated, we would like to formally request a Jurisdictional Determination site visit for wetlands located with the project area at your earliest convenience. Included is a disc containing an electronic word version of the Approved Jurisdictional Determination Form for your use.

If you have any questions or concerns, please contact me either by phone or by email.

ARCADIS G&M of North Carolina, Inc.

Sincerely,

ARCADIS G&M of North Carolina, Inc.

Robert Lepsic
Senior Scientist

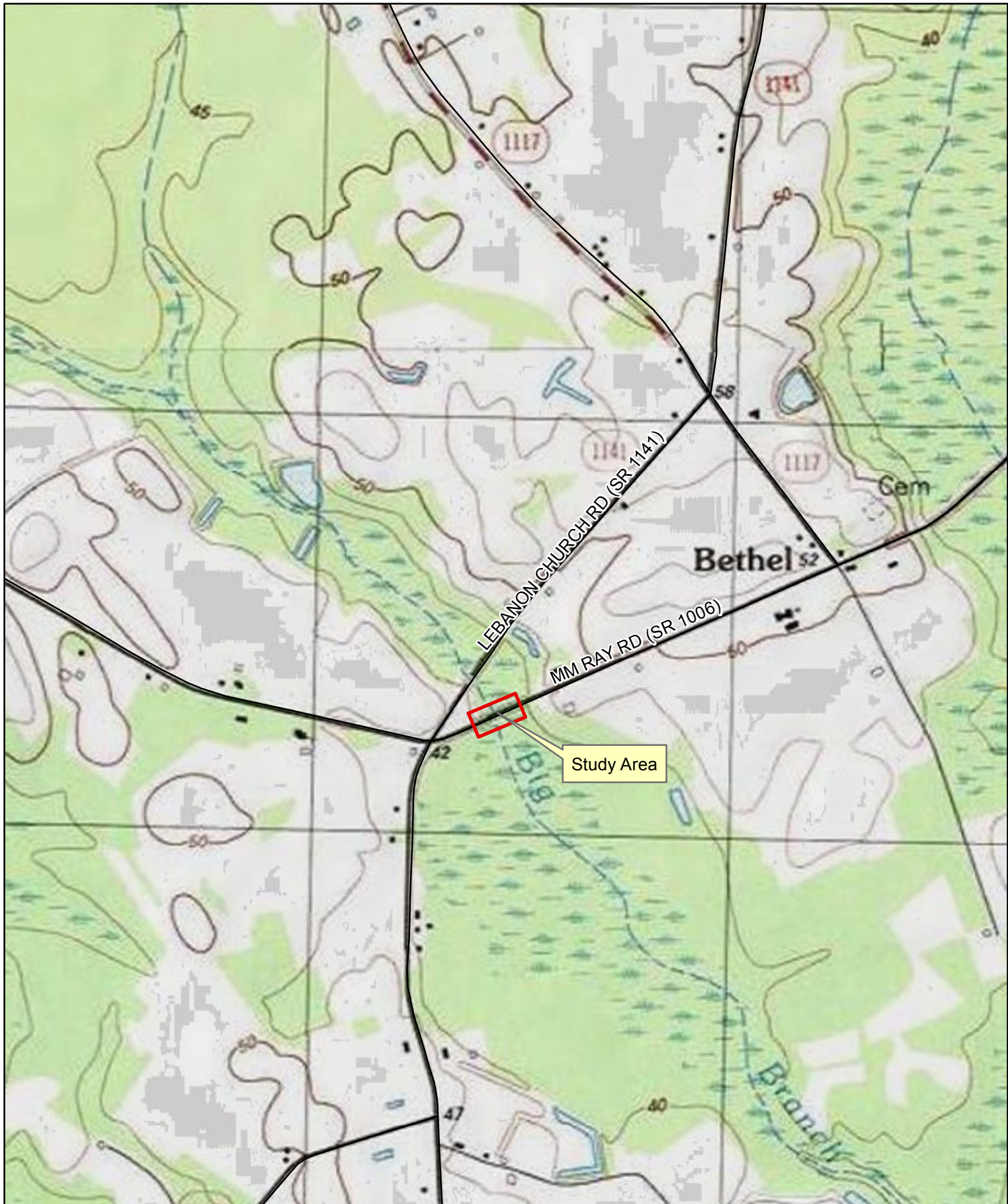
NC Engineering License # C-1869

NC Surveying License # C-1869

Copies:

Larry Upole, NCDOT
File

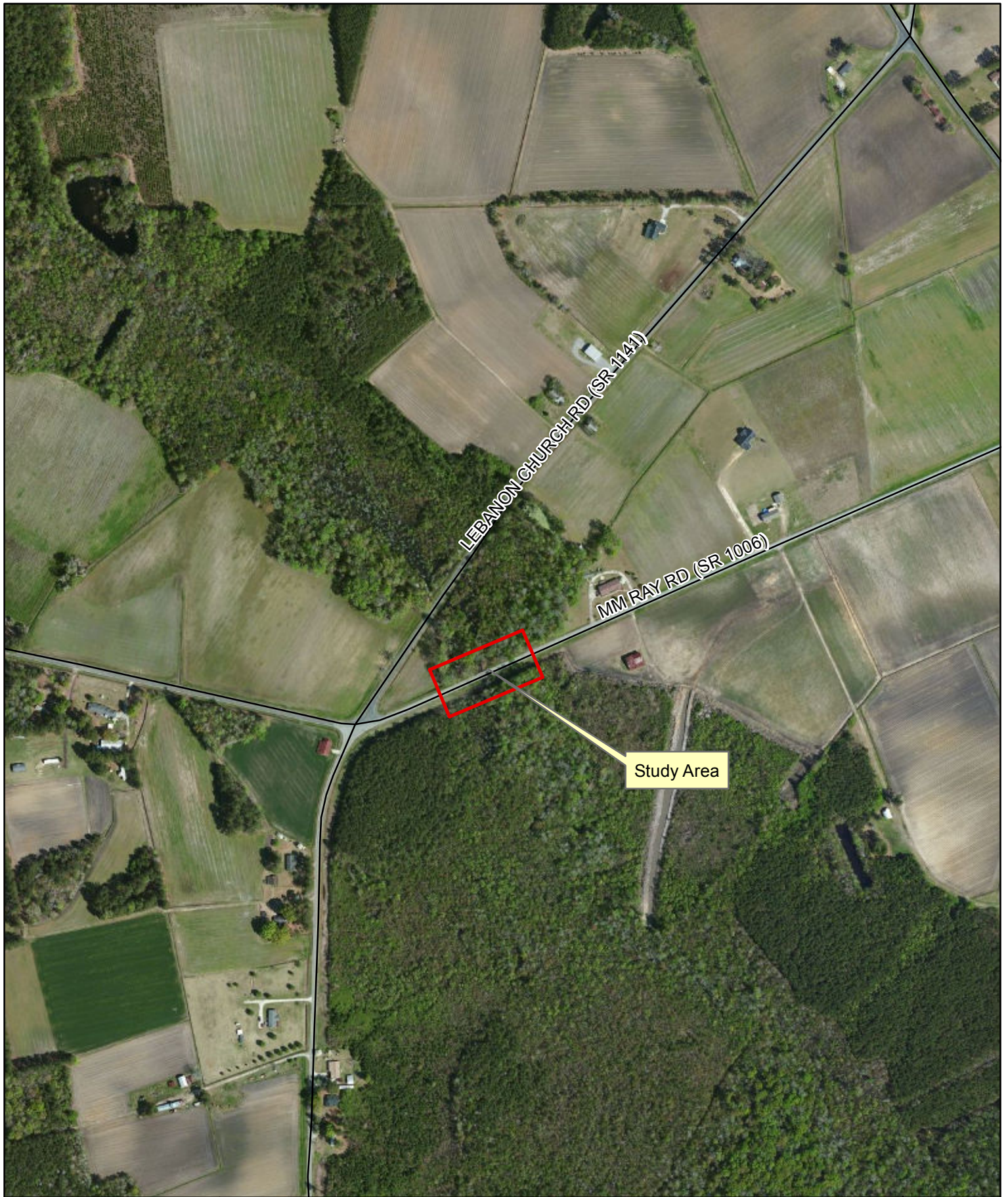
Imagine the result



0 500 1,000 2,000 Feet
1 inch = 1,000 feet

SITE LOCATION
Bridge No. 75 on MM Ray Rd
(SR 1006) over Big Branch
Columbus County, NC
*Source: USGS 7.5-minute
Topographic Quadrangle: Pireway*

FIGURE
1



0 500 1,000 Feet
1 inch = 500 feet

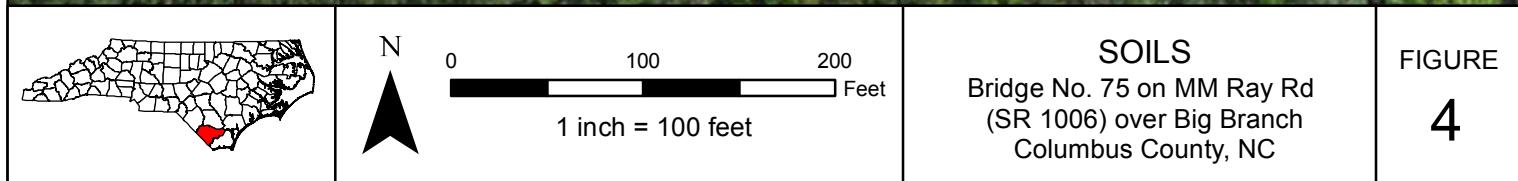
STUDY AREA
Bridge No. 75 on MM Ray Rd
(SR 1006) over Big Branch
Columbus County, NC

FIGURE
2



WETLAND DELINEATION
Bridge No. 75 on MM Ray Rd
(SR 1006) over Big Branch
Columbus County, NC

FIGURE
3





Wetland and SA looking downstream (south) from SR 1006

8/1/2012



Wetland and SA looking upstream (north) from SR 1006

8/1/2012

Bridge #75 on SR 1006 (MM Ray Road) over Big Branch

75 WB
WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Bridge 75 over Big Branch City/County: Columbus Co Sampling Date: 8/1/12
 Applicant/Owner: VEDOT State: NC Sampling Point: WB-04
 Investigator(s): R. Lepsic Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave to none Slope (%): 0-5
 Subregion (LRR or MLRA): LRR T Lat: 34.117151 Long: -78.718165 Datum: NAD83
 Soil Map Unit Name: Meggett fine sandy loam NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: <u>Point located within in beaver impoundment.</u> <u>Area upstream and downstream similar. One sample point taken</u> <u>for both areas.</u>		

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	_____ Drainage Patterns (B10)
<u>X</u> Water Marks (B1)	<u>X</u> Oxidized Rhizospheres along Living Roots (C3)	_____ Moss Trim Lines (B16)
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)
_____ Drift Deposits (B3)	_____ Recent Iron Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	_____ Geomorphic Position (D2)
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)
<u>X</u> Water-Stained Leaves (B9)		_____ FAC-Neutral Test (D5)
		_____ Sphagnum moss (D8) (LRR T, U)

Field Observations:			
Surface Water Present?	Yes <u>X</u> No _____	Depth (inches): <u>4</u>	Wetland Hydrology Present? Yes <u>X</u> No _____
Water Table Present?	Yes <u>X</u> No _____	Depth (inches): <u>6</u>	
Saturation Present? (includes capillary fringe)	Yes <u>X</u> No _____	Depth (inches): <u>4</u>	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Several beaver dam located on stream SA.
Water not flowing over dams.
Water appears lower than normal but standing water still
present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WB-04

Tree Stratum (Plot size: 20' x 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Quercus nigra</i>	40	X	FAC
2. <i>Ulmus americana</i>	30	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			

70 = Total Cover
 50% of total cover: 1 20% of total cover: 1

Sapling/Shrub Stratum (Plot size: 20' x 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Acer rubrum</i>	60	X	FAC
2. <i>Fraxinus pennsylvanica</i>	30	X	FACW
3. <i>Fraxinus caroliniana</i>	30	X	OBL
4. <i>Carpinus caroliniana</i>	5		FAC
5. <i>Clethra alnifolia</i>	5		FACW
6.			
7.			
8.			

100 = Total Cover
 50% of total cover: 1 20% of total cover: 2

Herb Stratum (Plot size: 20' x 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Sagittaria arifolia</i>	30	X	OBL
2. <i>Osmunda cinnamomea</i>	10		FACW
3. <i>Osmunda regalis</i>	10		OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

50 = Total Cover
 50% of total cover: 1 20% of total cover: 1

Woody Vine Stratum (Plot size: 20' x 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Campsis radicans</i>	10	X	FAC
2. <i>Smilax latifolia</i>	5	X	FAC
3.			
4.			
5.			

15 = Total Cover
 50% of total cover: 2 20% of total cover: 1

Remarks: (If observed, list morphological adaptations below).

Hummocks and buttressing present.
 Some spanish moss in trees

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of: Multiply by:

OBL species x 1 =

FACW species x 2 =

FAC species x 3 =

FACU species x 4 =

UPL species x 5 =

Column Totals: (A) (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

3 - Prevalence Index is $\leq 3.0^1$ Problematic Hydrophytic Vegetation¹ (Explain)¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No

SOIL

75 WB

Sampling Point: WB-04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-12"	10YR 3/2	95	10YR 4/6	5	D	PL	Silty clay	Few Fine Faint

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) (LRR P, T, U)
- ☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)
- ☐ Muck Presence (A8) (LRR U)
- ☐ 1 cm Muck (A9) (LRR P, T)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (MLRA 150A)
- ☐ Sandy Mucky Mineral (S1) (LRR O, S)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (LRR P, S, T, U)

- ☐ Polyvalue Below Surface (S8) (LRR S, T, U)
- ☐ Thin Dark Surface (S9) (LRR S, T, U)
- ☐ Loamy Mucky Mineral (F1) (LRR O)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (MLRA 151)
- ☐ Iron-Manganese Masses (F12) (LRR O, P, T)
- ☐ Umbric Surface (F13) (LRR P, T, U)
- ☐ Delta Ochric (F17) (MLRA 151)
- ☐ Reduced Vertic (F18) (MLRA 150A, 150B)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
- ☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

- ☐ 1 cm Muck (A9) (LRR O)
- ☐ 2 cm Muck (A10) (LRR S)
- ☐ Reduced Vertic (F18) (outside MLRA 150A,B)
- ☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)
- ☐ Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Redox features are oxidized rhizospheres

75 WB

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Bridge 75 over Big Branch City/County: Columbus Co Sampling Date: 8/1/12
 Applicant/Owner: NC DOT State: NC Sampling Point: WB-09-07
 Investigator(s): R. Hapsic Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope / roadbed Local relief (concave, convex, none): None Slope (%): 5-10%
 Subregion (LRR or MLRA): LRR T Lat: 34.117151 Long: -78.718165 Datum: NAD83
 Soil Map Unit Name: Meggett fine sandy loam NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No ☒ Hydric Soil Present? Yes _____ No ☒ Wetland Hydrology Present? Yes _____ No ☒	Is the Sampled Area within a Wetland? Yes _____ No ☒
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Remarks:

Sample point on road embankment.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

☐ Surface Water (A1) ☐ High Water Table (A2) ☐ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9)	☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) (LRR U) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)
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Secondary Indicators (minimum of two required)

☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)	
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Field Observations:

Surface Water Present? Yes _____ No ☒	Depth (inches): _____
Water Table Present? Yes _____ No ☒	Depth (inches): _____
Saturation Present? Yes _____ No ☒ (includes capillary fringe)	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not present

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WB 0409

Tree Stratum (Plot size: 5' x 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 5' x 5')

1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5' x 5')

1. Various grasses	100	X	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

100 = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 5' x 5')

1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes _____ No X

Remarks: (If observed, list morphological adaptations below).

Grasses could not be identified.
 Vegetation regularly mowed.
 Assuming grasses are UP

SOIL

75 WB

Sampling Point: WB-04 JP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/4	100	—	—	—	—	loam	many fine roots
3-12+	10YR 3/4	100	—	—	—	—	loam	few roots

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|---|--|
| ☐ Histosol (A1) | ☐ Polyvalue Below Surface (S8) (LRR S, T, U) | ☐ 1 cm Muck (A9) (LRR O) |
| ☐ Histic Epipedon (A2) | ☐ Thin Dark Surface (S9) (LRR S, T, U) | ☐ 2 cm Muck (A10) (LRR S) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (LRR O) | ☐ Reduced Vertic (F18) (outside MLRA 150A,B) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) | ☐ Piedmont Floodplain Soils (F19) (LRR P, S, T) |
| ☐ Stratified Layers (A5) | ☐ Depleted Matrix (F3) | ☐ Anomalous Bright Loamy Soils (F20) |
| ☐ Organic Bodies (A6) (LRR P, T, U) | ☐ Redox Dark Surface (F6) | ☐ (MLRA 153B) |
| ☐ 5 cm Mucky Mineral (A7) (LRR P, T, U) | ☐ Depleted Dark Surface (F7) | ☐ Red Parent Material (TF2) |
| ☐ Muck Presence (A8) (LRR U) | ☐ Redox Depressions (F8) | ☐ Very Shallow Dark Surface (TF12) |
| ☐ 1 cm Muck (A9) (LRR P, T) | ☐ Marl (F10) (LRR U) | ☐ Other (Explain in Remarks) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Ochric (F11) (MLRA 151) | |
| ☐ Thick Dark Surface (A12) | ☐ Iron-Manganese Masses (F12) (LRR O, P, T) | |
| ☐ Coast Prairie Redox (A16) (MLRA 150A) | ☐ Umbric Surface (F13) (LRR P, T, U) | |
| ☐ Sandy Mucky Mineral (S1) (LRR O, S) | ☐ Delta Ochric (F17) (MLRA 151) | |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Reduced Vertic (F18) (MLRA 150A, 150B) | |
| ☐ Sandy Redox (S5) | ☐ Piedmont Floodplain Soils (F19) (MLRA 149A) | |
| ☐ Stripped Matrix (S6) | ☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) | |
| ☐ Dark Surface (S7) (LRR P, S, T, U) | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Sample point taken in road fill.

75 WB

WETLAND RATING WORKSHEET Fourth Version

Project Name Bridge 75 over Big Branch Nearest Road MM Ray Road (SR 1006)
 County Columbus Wetland area >5 acres Wetland width >100 feet
 Name of evaluator R. Lapsir Date 8/1/12

Wetland location

☐ on pond or lake
☒ on perennial stream
☐ on intermittent stream
☐ within interstream divide
☐ other: _____

Adjacent land use

(within 1/2 mile upstream, upslope, or radius)

☒ forested/natural vegetation 50 %
☒ agriculture, urban/suburban 50 %
☒ impervious surface 1 %

Soil series: Meggett fine sandy loam

☐ predominantly organic - humus, muck, or peat
☐ predominantly mineral - non-sandy
☒ predominantly sandy

Dominant vegetation

(1) Aster rubrum
 (2) Quercus nigra
 (3) Sagittaria arifolia

Hydraulic factors

☐ steep topography
☐ ditched or channelized
☒ total wetland width $\geq$ 100 feet

Flooding and wetness

☐ semipermanently to permanently flooded or inundated
☒ seasonally flooded or inundated
☐ intermittently flooded or temporary surface water
☐ no evidence of flooding or surface water

Wetland type (select one)*

☒ Bottomland hardwood forest
☐ Headwater forest
☐ Swamp forest
☐ Wet flat
☐ Pocosin
☐ Bog forest

☐ Pine savanna
☐ Freshwater marsh
☐ Bog/fen
☐ Ephemeral wetland
☐ Carolina bay
☐ Other: _____

* The rating system cannot be applied to salt or brackish marshes or stream channels

R	Water storage	<u>4</u>	x 4.00 =	<u>16</u>
A	Bank/Shoreline stabilization	<u>3</u>	x 4.00 =	<u>12</u>
T	Pollutant removal	<u>1</u>	** x 5.00 =	<u>5</u>
I	Wildlife habitat	<u>4</u>	x 2.00 =	<u>8</u>
N	Aquatic life value	<u>3</u>	x 4.00 =	<u>12</u>
G	Recreation/Education	<u>0</u>	x 1.00 =	<u>0</u>
Wetland rating 63				

** Add 1 point if in sensitive watershed and >10% nonpoint source disturbance within 1/2 mile upstream, upslope, or radius

75 SA

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

Date: <u>8/1/12</u>	Project/Site: <u>Bridge 75 on SR 1006</u>	Latitude: <u>34.117151</u>
Evaluator: <u>R. Leppic</u>	County: <u>Columbus</u>	Longitude: <u>-78.718165</u>
Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other <u>Drainway</u> e.g. Quad Name:

A. Geomorphology (Subtotal = 15.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	<u>2</u>	3
2. Sinuosity of channel along thalweg	0	1	<u>2</u>	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence <u>None</u>	<u>0</u>	1	2	3
4. Particle size of stream substrate <u>fine</u>	0	1	2	3
5. Active/relict floodplain	0	1	<u>2</u>	3
6. Depositional bars or benches	0	<u>1</u>	2	3
7. Recent alluvial deposits	0	1	<u>2</u>	3
8. Headcuts	0	<u>1</u>	2	3
9. Grade control <u>beaver dams</u>	0	0.5	<u>1</u>	1.5
10. Natural valley	0	0.5	1	<u>1.5</u>
11. Second or greater order channel	No = 0		<u>Yes = 3</u>	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)

12. Presence of Baseflow	0	1	2	<u>3</u>
13. Iron oxidizing bacteria	<u>0</u>	1	2	3
14. Leaf litter	<u>1.5</u>	1	0.5	0
15. Sediment on plants or debris	0	<u>0.5</u>	1	1.5
16. Organic debris lines or piles	0	<u>0.5</u>	1	1.5
17. Soil-based evidence of high water table?	No = 0		<u>Yes = 3</u>	

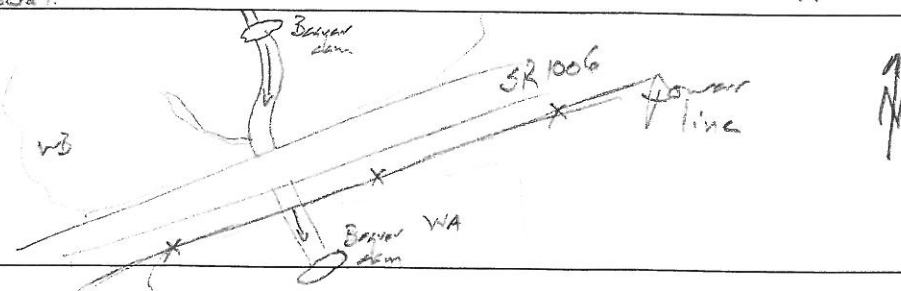
C. Biology (Subtotal = 10)

18. Fibrous roots in streambed	3	<u>2</u>	1	0
19. Rooted upland plants in streambed	3	<u>2</u>	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	<u>2</u>	3
21. Aquatic Mollusks	<u>0</u>	1	2	3
22. Fish	0	0.5	<u>1</u>	1.5
23. Crayfish	0	0.5	<u>1</u>	1.5
24. Amphibians	0	0.5	<u>1</u>	1.5
25. Algae	0	0.5	<u>1</u>	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Several beaver dams. Water not flowing over dam. Water appears lower than usual.

Sketch:



USACE AID# _____

DWQ # _____

Site # _____ (indicate on attached map)



STREAM QUALITY ASSESSMENT WORKSHEET



Provide the following information for the stream reach under assessment:

- Applicant's name: NGDOT
- Evaluator's name: R. Lapsia
- Date of evaluation: 8/1/12
- Time of evaluation: 11:00 AM
- Name of stream: Big Branch
- River basin: Waggoner
- Approximate drainage area: 3.0 square miles
- Stream order: 2nd
- Length of reach evaluated: ~ 200'
- County: Columbus
- Site coordinates (if known): prefer in decimal degrees.
- Subdivision name (if any): N/A
- Latitude (ex. 34.872312): 34.117151
- Longitude (ex. -77.556611): -78.718165
- Method location determined (circle): GPS ☒ Topo Sheet ☐ Ortho (Aerial) ☐ Photo/GIS ☐ Other GIS ☐ Other ☐
- Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location):
Approximately 9.7 mile east of Tabor City on MM. Ray Road (SR 1006)
- Proposed channel work (if any): Bridge to culvert replacement
- Recent weather conditions: Afternoon scattered thunder showers
- Site conditions at time of visit: Hot and dry
- Identify any special waterway classifications known: ☐ Section 10 ☐ Tidal Waters ☐ Essential Fisheries Habitat ☐ Trout Waters ☐ Outstanding Resource Waters ☐ Nutrient Sensitive Waters ☐ Water Supply Watershed ☐ (I-IV)
- Is there a pond or lake located upstream of the evaluation point? ☒ YES ☐ NO If yes, estimate the water surface area: 6.5 acres
- Does channel appear on USGS quad map? ☒ YES ☐ NO
- Does channel appear on USDA Soil Survey? ☒ YES ☐ NO
- Estimated watershed land use: 10% Residential ☐ % Commercial ☐ % Industrial 30% Agricultural 60% Forested ☐ % Cleared / Logged ☐ % Other ()
- Bankfull width: 10-12'
- Bank height (from bed to top of bank): 1-2'
- Channel slope down center of stream: ☒ Flat (0 to 2%) ☐ Gentle (2 to 4%) ☐ Moderate (4 to 10%) ☐ Steep (>10%)
- Channel sinuosity: ☐ Straight ☒ Occasional bends ☐ Frequent meander ☐ Very sinuous ☐ Braided channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 63 Comments: Several beaver dams on stream. Water not flowing over dams but water in channel. Water appears lower than normal. Adjacent road and its impact stream. Several piles of old bottles and junk between rd and stream. No insects observed in stream.

Evaluator's Signature

Date 8/15/12

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0-5	0-4	0-5	4 water in channel
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0-6	0-5	0-5	5 some dumping
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0-6	0-4	0-5	4 road and Ag
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0-5	0-4	0-4	4 trash road Ag
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0-3	0-4	0-4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0-4	0-4	0-2	2 not extensive
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0-5	0-4	0-2	4 frequent
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0-6	0-4	0-2	4 large
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0-5	0-4	0-3	3
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0-5	0-4	0-4	4 none observed
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0-4	0-5	/
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0-5	0-4	0-5	3 some widening
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0-5	0-5	0-5	4 nothing major
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0-3	0-4	0-5	2 moderate
	15	Impact by agriculture, livestock, or timber production (substantial impact = 0; no evidence = max points)	0-5	0-4	0-5	3 adjacent Ag
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0-3	0-5	0-6	0 no riffles
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0-6	0-6	0-6	2 not complex
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0-5	0-5	0-5	3 road and Ag
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0-4	0-4	/
BIOLOGY	20	Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points)	0-4	0-5	0-5	2 dragon/damselfly mosquito
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	2 frog
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	2 no fish
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0-6	0-5	0-5	4 deer + raccoon
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						63

* These characteristics are not assessed in coastal streams.