

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): December 17, 2014

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: MVN 2007-04022-SQ Harrison-Swain Basis Form 2, eastern portion

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: LA County/parish/borough: Livingston City:
Center coordinates of site (lat/long in degree decimal format): Lat. 30.542808° N, Long. 90.841582° W.
Universal Transverse Mercator:

Name of nearest waterbody: Dick Hill Branch
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Colyell Bay/Amite River
Name of watershed or Hydrologic Unit Code (HUC): 8070202
 Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
 Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date:
 Field Determination. Date(s): 12-13-2014

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

Waters subject to the ebb and flow of the tide.
 Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: 1700 linear feet: 10-15 width (ft) and/or acres.
Wetlands: 17 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known): .

2. Non-regulated waters/wetlands (check if applicable):³

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
Explain: .

Complainant's Ex. 23
CWA-06-2012-2710

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is “adjacent”: .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are “relatively permanent waters” (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: 1890 **square miles**

Drainage area: 1130 **acres**

Average annual rainfall: 60+ inches

Average annual snowfall: inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

Tributary flows directly into TNW.

Tributary flows through **3** tributaries before entering TNW.

Project waters are **10-15** river miles from TNW.

Project waters are **1-2** river miles from RPW.

Project waters are **10-15** aerial (straight) miles from TNW.

Project waters are **1 (or less)** aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain: no.

Identify flow route to TNW⁵: Wetland to unnamed tributary (non-RPW) to Dick Hill Branch (seasonal RPW) to Middle Colyell Creek to Colyell Creek to Colyell Bay/Amite River.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is: Natural
 Artificial (man-made). Explain: .
 Manipulated (man-altered). Explain: partly channelized during silviculture activities.

Tributary properties with respect to top of bank (estimate):

Average width: 10-15 feet

Average depth: 5-6 feet

Average side slopes: **2:1**.

Primary tributary substrate composition (check all that apply):

Silts Sands Concrete
 Cobbles Gravel Muck
 Bedrock Vegetation. Type/% cover:
 Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: relatively stable.

Presence of run/riffle/pool complexes. Explain: no.

Tributary geometry: **Meandering**

Tributary gradient (approximate average slope): 1-2 %

(c) Flow:

Tributary provides for: **Intermittent but not seasonal flow**

Estimate average number of flow events in review area/year: **20 (or greater)**

Describe flow regime: flow during and after rain events after soil saturation, trickling between rain events, overbank flooding and inundation during high water periods in Middle Colyell Creek.

Other information on duration and volume: development in area increased volume and decreased duration, channelized areas have increased volume downstream.

Surface flow is: **Discrete**. Characteristics: overbank flooding during high water.

Subsurface flow: **Unknown**. Explain findings: not determined at this time.

Dye (or other) test performed: .

Tributary has (check all that apply):

Bed and banks
 OHWM⁶ (check all indicators that apply):
 clear, natural line impressed on the bank the presence of litter and debris
 changes in the character of soil destruction of terrestrial vegetation
 shelving the presence of wrack line
 vegetation matted down, bent, or absent sediment sorting
 leaf litter disturbed or washed away scour
 sediment deposition multiple observed or predicted flow events
 water staining abrupt change in plant community
 other (list):
 Discontinuous OHWM.⁷ Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

High Tide Line indicated by: Mean High Water Mark indicated by:
 oil or scum line along shore objects survey to available datum;
 fine shell or debris deposits (foreshore) physical markings;
 physical markings/characteristics vegetation lines/changes in vegetation types.
 tidal gauges
 other (list):

(iii) **Chemical Characteristics:**

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: slightly cloudy.

Identify specific pollutants, if known: silt and clay sediments, oil & grease from roads, fertilizer and pesticides, organics.

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

(iv) **Biological Characteristics. Channel supports (check all that apply):**

- Riparian corridor. Characteristics (type, average width): Forested 50 ft wide.
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: observed by neighbors- mosquitofish, amphibians, reptiles, birds,

mammals.

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:

Properties:

Wetland size: 8 acres

Wetland type. Explain: Forested.

Wetland quality. Explain: disturbed by historical silviculture.

Project wetlands cross or serve as state boundaries. Explain: no.

(b) General Flow Relationship with Non-TNW:

Flow is: **Intermittent flow**. Explain: Flow in both directions between wetlands and non-RPW during saturated periods and high water table. Otherwise, flow during and after rain events, trickling to no flow between events.

Surface flow is: **Overland sheetflow**

Characteristics:

Subsurface flow: **Unknown**. Explain findings: not determined at this time.

Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting

Not directly abutting

Discrete wetland hydrologic connection. Explain:

Ecological connection. Explain:

Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **10-15** river miles from TNW.

Project waters are **10-15** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters**.

Estimate approximate location of wetland as within the **50 - 100-year** floodplain.

(ii) **Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: slightly cloudy, Watershed moderately developed, still partly forested.

Identify specific pollutants, if known: silt and clay sediments, organic matter.

(iii) **Biological Characteristics. Wetland supports (check all that apply):**

Riparian buffer. Characteristics (type, average width):

Vegetation type/percent cover. Explain: Hardwood flat 100% cover.

Habitat for:

Federally Listed species. Explain findings:

Fish/spawn areas. Explain findings:

Other environmentally-sensitive species. Explain findings:

Aquatic/wildlife diversity. Explain findings: amphibians, crustaceans, birds, reptiles, mammals-sign or observed.

3. **Characteristics of all wetlands adjacent to the tributary (if any)**

All wetland(s) being considered in the cumulative analysis: **7**

Approximately (60) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>	<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>
y	22	y	4.5
n	9	n	7.3
n	4	n	8
n	5.2		

Summarize overall biological, chemical and physical functions being performed: Functions include flood storage, sediment retention, pollutant retention, carbon retention and contribution, nutrient recycling, wildlife habitat.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Wetland on property is adjacent to a non-RPW onsite; the non-RPW is an RPW in its lower reaches. Floodwater storage and sediment and pollution retention functions accrue in wetlands here; remaining pollutants enter the non-RPW and the RPW downstream. Carbon and organisms are also carried to the RPW from the wetland. Contributions of wetlands to the biological, chemical, and physical makeup of TNWs is well-documented in the literature (see references below). Physical characteristics on the site, including sediment deposits, rack lines (including organic material and organisms), scoured areas, water marks, etc., are evidence of both retention in the wetland and suspension of pollutants in the water column at the point where water exits the wetland. Given the number and intensity of rain and flow events in this region (greater than 60 days annually, with more than 0.1 inch rainfall), sediments, pollutants, carbon, and organisms in excess of the assimilative capacity of the RPWs will remain suspended in the water column long enough to reach the TNW. Thus the tributary, in combination with adjacent wetlands and other similarly situated wetlands, provide a direct and acute contribution to the chemical, physical, and biological makeup of the TNW. Further discussion is included in Section IV.B.
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.

Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
- Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Offsite tributary is backed up and floods forested wetlands every few years, repeated observations of flow by residents.

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
- Identify type(s) of waters: .

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: **1700** linear feet **10-15** width (ft).
- Other non-wetland waters: acres.
- Identify type(s) of waters: .

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .
- Wetlands directly abutting an RPW where tributaries typically flow “seasonally.” Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: **17** acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- Demonstrate that impoundment was created from “waters of the U.S.,” or
- Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- Demonstrate that water is isolated with a nexus to commerce (see E below).

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

- which are or could be used by interstate or foreign travelers for recreational or other purposes.
- from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- which are or could be used for industrial purposes by industries in interstate commerce.
- Interstate isolated waters. Explain: .
- Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
Identify type(s) of waters: .
- Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps: .
- Corps navigable waters' study: .
- U.S. Geological Survey Hydrologic Atlas: .
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: Satsuma, LA.
- USDA Natural Resources Conservation Service Soil Survey. Citation: Soil Survey of Livingston Parish.
- National wetlands inventory map(s). Cite name: .
- State/Local wetland inventory map(s): .

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): 1998 IR, 2004 IR.
or Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify): USDA NRCS National Water and Climate Center Web Page.

Alexander, R.B., E.W. Boyer, R.A. Smith, G.E. Schwartz, and R.B. Moore, 2007. The Role of Headwater Streams in Downstream Water Quality. *Journal of the American Water Resources Association* 43. DOI: 10.1111/j.1752-1688.2007.00005.x.

Kappiella, Karen, and Lisa Fraley-McNeat. 2007. The Importance of Protecting Vulnerable Streams and Wetlands at the Local Level. *Wetlands and Watersheds Article #6*. Center for Watershed Protection. Elliot City, Maryland, for Office of Wetlands, Oceans, and Watersheds. U.S. Environmental Protection, Washington, D.C.

Meyer, Judy et al. 2003. *Where Rivers are Born: The Scientific Imperative for Defending Small Streams and Wetlands*. Sierra Club.

Mitsch, W.J., J.W. Day Jr, J.W. Gilliam, P.M. Groffman, D.L. Hey, G.W. Randall, and N. Wang, 2001. Reducing Nitrogen Loading to the Gulf of Mexico From the Mississippi River Basin: Strategies to Counter a Persistent Ecological Problem. *Bioscience* 51:373-388.

North Carolina Division of Water Quality (NCDWQ). 2006. *The Ecological and Water Quality Value of Headwater Wetlands in North Carolina*. North Carolina Division of Water Quality. Raleigh, North Carolina.

Saksa, Philip; Xu, Yi Jun; Stich, Richard Date: 2013 Hydrologic influence on sediment transport of low-gradient, forested headwater streams in central Louisiana In: Guldin, James M., ed. 2013. *Proceedings of the 15th biennial southern silvicultural research conference*. e-Gen. Tech. Rep. SRS-GTR-175. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 551-558. Station ID: Paper (invited, offered, keynote)-SRS-175

Tracie-Lynn Nadeau & Mark Cable Rains, *Hydrological Connectivity Between Headwater Streams and Downstream Waters: How Science Can Inform Policy*, 43(1) *J. AM. WATER RESOURCES ASS'N* 118–133 (2007)

Wipfli, M.S., J.S. Richardson, and R.J. Naiman, 2007. Ecological Linkages Between Headwaters and Downstream Ecosystems: Transport of Organic Matter, Invertebrates, and Wood Down Headwater Channels. *Journal of the American Water Resources Association* 43, DOI: 10.1111/j.1752-1688.2007.00007.x.

Zimmerman, R.J. and J.M. Nance, 2001. Effects of Hypoxia on the Shrimp Fishery of Louisiana and Texas. *Coastal and Estuarine Sciences* 58:293-310

B. ADDITIONAL COMMENTS TO SUPPORT JD: Wetlands on property are part of a system of wetlands on non-RPW tributaries that have been altered by silviculture activities. These wetlands were likely more extensive on the property at one time. Historically, a drainage channel was created within wetlands on the eastern part of the property. This channel ends within a portion of the wetlands and does not provide a direct connection to Dick Hill Branch; however, occasional flooding in this wetland, which extends contiguously to Dick Hill Branch, provides a continuous surface water connection with Dick Hill Branch during periods of flooding. Indications of flow from the wetland and conveyance was observed by MVN during site investigations.

Mosquitofish (*Gambusia* sp.) were present when water was present in the conveyance on the upstream and downstream sides of the driveway culvert. This firmly establishes an aquatic connection and continuous surface water connection between the directly abutting wetland and the downstream system at various times since the mosquitofish would not be able to survive drier periods in the upper portions of the channel when inundation is absent for prolonged periods. This aquatic connection was observed by MVN as water was passing through the culvert under the driveway. Mosquitofish are live bearers and, as such, cannot be transported as eggs on the legs of birds or other mechanisms. The mosquitofish must have swum in a continuous water column into the conveyance on the subject property.

The non-RPW has enough active flow to support aquatic organisms, which would show the water column in the non-RPW extends up to the wetland on the property. The historic and recent hydrological connectivity between the wetland and the non-RPW is not speculative and is evidenced by live aquatic organisms on both sides of the driveway, in addition to observations of local citizens. Local citizens report inundation in the conveyance and wetlands on the property after a number of ordinary rain events.

In spite of increased flow rates due to development and enhanced drainage in the area, the associated wetland system holds water back from the non-RPW, thereby directly affecting the integrity of the non-RPW, the receiving RPW (lower reaches of Dick Hill Branch), Hornsby Creek (RPW), and Colyell Creek (RPW and TNW) in a more positive respect. Regular high flows are adequate to suspend sediments and other particulates. When inundation is not present, indicators on the project site and in the non-RPW, including sediment deposits and water-stained leaves in the wetland and scouring and deposition in the conveyances, demonstrate that sediments and pollutants are suspended in the water column at the point where the water exits the wetland and downstream in the tributary. When inundated, suspended sediments and organic matter were directly observed in the water column flowing from the wetland to the non-RPW. During relatively low flow periods, a portion of sediments and other pollutants will be assimilated by the tributary and associated wetland. During relatively higher flows, a portion of the pollutants will be re-disturbed and additional pollutants will be contributed to the non-RPW and the downstream system. Pollutants in excess of the assimilative capacity of the non-RPW and associated wetlands will eventually reach Dick Hill Branch. Likewise, a portion of the pollutants in excess of the assimilative capacity of Dick Hill Branch and Hornsby Creek will eventually reach Colyell Creek.

Development in the area has increased flow rates and decreased beneficial functions of wetlands that contribute to the integrity of the downstream RPWs. In the context of the overall pollutant contributions to the receiving RPW and eventually the TNW, the effect of relatively unimpaired water from the wetland will be positive because it will help dilute sediments and other pollutants that are entering the relevant reach from properties downstream of the subject property.

The tributary and associated wetland in the subject watershed can impact the TNW adversely and beneficially. To the extent that the wetland, similarly situated wetland, and the tributary can withhold sediments, pollutants, carbon, and floodwater, this system collectively has a significant positive effect on the integrity of the TNW. Where portions of the system have been disturbed or removed, including channelization and clearing for development, the tributary and associated wetland will have less beneficial effects on the TNW due to reduced system functionality. Similarly, events that exceed the assimilative capacity of the system will have marked negative and/or positive effects on the downstream system. Thus, the tributary and associated wetlands have a significant nexus with the TNW.

The presence of sediment deposits in the tributary and associated wetlands demonstrates four functions accruing in the wetland that will affect the water quality of the TNW: floodwater storage, sediment retention, pollution retention, and organic carbon transport. In order for sediment deposits to be present in a wetland, flows from adjacent uplands and within the wetland itself were substantial enough to suspend silt and clay particles. This would also substantiate suspension of organic particulates within the size ranges that can be readily transported to downstream waters. Additionally, repeated direct observations of inundation and the presence of sediment deposits in the tributary and associated wetlands substantiate inundation in the tributary system. The duration is long enough for silt and clay sediments and organic carbon to fall out of suspension and to be sequestered by the wetland. This would also substantiate flood storage in the tributary and associated wetlands, which would directly affect the functionality of the downstream waters, based on general flow characteristics and potential assimilative capacities. In a parish averaging over 60 inches of precipitation per year, with events of 0.1" or greater occurring, on average, more than 20 days per year, saturation and flow from the wetland commonly occur on this site.

A number of birds, other wildlife sign including deer tracks, rabbit droppings, and raccoon tracks were observed traversing the property. The wetlands and tributary provide organic matter to food webs in Dick Hill Branch and downstream waters. This is based on the observation of organic matter moving downstream that would provide carbon to the system as well as food and substrate for aquatic insects in the tributary and associated wetlands during periods of inundation. Aquatic insects observed in and supported by the wetlands and tributary provide food for fish in downstream waters.

The significant nexus between the TNW and the non-RPW and its associated wetlands has several facets. The entire Colyell Creek system and watershed has been impacted by development and the subsequent reduction in wetland functions. This fact increases the significance of every wetland that contributes positively to the aquatic ecosystem and water quality in the system and the TNW. Primarily, positive significant impacts accrue to the TNW from the tributary and associated wetlands, as well as wetlands throughout the watershed. Given the level of development in the area, all such wetlands become increasingly more important locally and thus have a significant impact on the physical, biological, and chemical integrity of the TNW. Importance is an ecological measure of the significance of the functions of the wetland within a prescribed area. The wetland on the property is part of the larger remaining wetland on this tributary and therefore accounts for the majority of positive wetland functionality on the tributary above Courtney Road and its contribution to the downstream Hornsby Creek and Colyell systems.

Residences along Nancy drive are not connected to a central sewer system, but have individual treatment systems. A number of the systems discharge effluent directly into the roadside ditch along Nancy Drive. A portion of the effluent flows to the east of Nancy Drive and through the wetland system along Dick Hill Branch, including wetlands on the eastern side of the property. Middle Colyell Creek and Hornsby Creek, on both sides of the site of the site and the entire Colyell Creek system are listed as impaired waters by EPA for primary recreational contact due to fecal coliform from onsite treatment systems. Additionally the Collyell Creek and its tributaries have in the past been impaired for primary fish and shellfish production due to Biological Oxygen Demand (BOD) and nutrients from similar sources. In the context of the overall pollutant contributions to the receiving RPW and eventually the TNW, the effect of relatively unimpaired water from the wetland will be positive because it will help dilute or sequester sewage effluent, sediments, and other pollutants that are entering the relevant reach from properties downstream of the subject property.

Hornsby Creek downstream of the property has been severely channelized and deeply cut by excavation and subsequent erosion. Hornsby Creek is subsequently severed from interaction with its floodplain and that assimilative capacity and attenuating influence. Floodplain functionality having been reduced to only overland sheetflow from adjacent uplands during each rain event, the main channel currently acts as a conduit, thereby allowing water to flow more quickly to the TNW. Due to the enhanced, accelerated flows in the main channel, turbidity and suspended pollutants remain in the water column longer, with more opportunity to reach the TNW more directly. This channelization increases the significance of the nexus between the TNW and Dick Hill Branch and associated wetlands. It also increases the significance of the positive impacts from tributary and the remaining wetlands, including subject wetlands on the property,

The specific functions accruing in the tributary and associated wetlands include stormwater flow attenuation, short and long-term floodwater storage, nutrient retention and sequestration, sediment retention, and organic matter retention and sequestration, in addition to wildlife habitat. Several of these functions, including nutrient retention and organic matter retention, directly affect the manipulated nature of

the downstream waters in the Ponchitalawa system. Short and long-term flood storage, sediment and organic matter retention, contribution to downstream food webs, and wildlife habitat functions were observed directly on the site by MVN.

Given its position on the landscape and its size, another of the subject wetland's major functions is stormwater runoff attenuation. The ability of the wetland to retain floodwater in a given event will enhance capacity of the tributary to accommodate accelerated flow from adjacent and downstream developed areas that have lost wetlands and stormwater attenuation previously associated with those wetlands. Furthermore, the floodwater storage function enables all the other functions in the wetland. Not only is stormwater flow attenuated during and after these events, but sediment deposition, organic matter, and other depositions occur because of the floodwater retention. These functions in this wetland are critical to contributing relatively higher quality water into the manipulated systems of Hornsby Creek and Colyell Creek.

It is well established in the scientific literature that upper reach wetlands and waters play a significant role in the characteristics of the downstream waters (see references listed in Section IV. A above). The condition of any RPW or TNW is the sum of the condition of all the inputs from wetlands and tributaries that contribute flow into the RPW or TNW. "Alteration of small streams and wetlands disrupts the quantity and availability of water in a stream and river system." (Meyer et al., 2006).

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): December 17, 2014

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: MVN 2007-04022-SQ Harrison-Swain Basis form 1 western portion

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: LA County/parish/borough: Livingston City:
Center coordinates of site (lat/long in degree decimal format): Lat. 30.546295° N, Long. 90.845426° W.
Universal Transverse Mercator:

Name of nearest waterbody: tributary of Middle Colyell Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Colyell Bay/Amite River
Name of watershed or Hydrologic Unit Code (HUC): 8070202

- Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
 Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- Office (Desk) Determination. Date:
 Field Determination. Date(s): 12-13 Dec 2014

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
 Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- TNWs, including territorial seas
 Wetlands adjacent to TNWs
 Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 Non-RPWs that flow directly or indirectly into TNWs
 Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 Impoundments of jurisdictional waters
 Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: 2700 linear feet: 5-8 width (ft) and/or acres.
Wetlands: 6 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known): .

2. Non-regulated waters/wetlands (check if applicable):³

- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
Explain: .

Complainant's Ex. 24
CWA-06-2012-2710

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**

Identify TNW: .

Summarize rationale supporting determination: .

2. **Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is “adjacent”: .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are “relatively permanent waters” (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

(i) **General Area Conditions:**

Watershed size: 1890 **square miles**

Drainage area: 77 **acres**

Average annual rainfall: 60+ inches

Average annual snowfall: inches

(ii) **Physical Characteristics:**

(a) **Relationship with TNW:**

Tributary flows directly into TNW.

Tributary flows through **2** tributaries before entering TNW.

Project waters are **10-15** river miles from TNW.

Project waters are **1 (or less)** river miles from RPW.

Project waters are **10-15** aerial (straight) miles from TNW.

Project waters are **1 (or less)** aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain: no.

Identify flow route to TNW⁵: Wetland to unnamed tributary (non-RPW) to Middle Colyell Creek (RPW) to Colyell Creek to Colyell Bay/Amite River.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is: Natural
 Artificial (man-made). Explain: .
 Manipulated (man-altered). Explain: partly channelized during silviculture activities.

Tributary properties with respect to top of bank (estimate):

Average width: 5-8 feet

Average depth: 2-3 feet

Average side slopes: **2:1**.

Primary tributary substrate composition (check all that apply):

Silts Sands Concrete
 Cobbles Gravel Muck
 Bedrock Vegetation. Type/% cover:
 Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: relatively stable.

Presence of run/riffle/pool complexes. Explain: no.

Tributary geometry: **Meandering**

Tributary gradient (approximate average slope): 1-2 %

(c) Flow:

Tributary provides for: **Intermittent but not seasonal flow**

Estimate average number of flow events in review area/year: **20 (or greater)**

Describe flow regime: flow during and after rain events after soil saturation, trickling between rain events, overbank flooding and inundation during high water periods in Middle Colyell Creek.

Other information on duration and volume: development in area increased volume and decreased duration, channelized areas have increased volume downstream.

Surface flow is: **Discrete**. Characteristics: overbank flooding during high water.

Subsurface flow: **Unknown**. Explain findings: not determined at this time.

Dye (or other) test performed: .

Tributary has (check all that apply):

Bed and banks
 OHWM⁶ (check all indicators that apply):
 clear, natural line impressed on the bank the presence of litter and debris
 changes in the character of soil destruction of terrestrial vegetation
 shelving the presence of wrack line
 vegetation matted down, bent, or absent sediment sorting
 leaf litter disturbed or washed away scour
 sediment deposition multiple observed or predicted flow events
 water staining abrupt change in plant community
 other (list):
 Discontinuous OHWM.⁷ Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

High Tide Line indicated by: Mean High Water Mark indicated by:
 oil or scum line along shore objects survey to available datum;
 fine shell or debris deposits (foreshore) physical markings;
 physical markings/characteristics vegetation lines/changes in vegetation types.
 tidal gauges
 other (list):

(iii) **Chemical Characteristics:**

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: slightly cloudy.

Identify specific pollutants, if known: silt and clay sediments, oil & grease from roads, fertilizer and pesticides, organics.

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

(iv) **Biological Characteristics. Channel supports (check all that apply):**

- Riparian corridor. Characteristics (type, average width): Forested 50 ft wide.
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: observed by neighbors- mosquitofish, amphibians, reptiles, birds,

mammals.

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:

Properties:

Wetland size: 6 acres

Wetland type. Explain: Forested.

Wetland quality. Explain: disturbed by historical silviculture.

Project wetlands cross or serve as state boundaries. Explain: no.

(b) General Flow Relationship with Non-TNW:

Flow is: **Intermittent flow**. Explain: Flow in both directions between wetlands and non-RPW during saturated periods and high water table. Otherwise, flow during and after rain events, trickling to no flow between events.

Surface flow is: **Overland sheetflow**

Characteristics:

Subsurface flow: **Unknown**. Explain findings: not determined at this time.

Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting

Not directly abutting

Discrete wetland hydrologic connection. Explain:

Ecological connection. Explain:

Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **10-15** river miles from TNW.

Project waters are **10-15** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters**.

Estimate approximate location of wetland as within the **50 - 100-year** floodplain.

(ii) **Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: slightly cloudy, Watershed moderately developed, still partly forested.

Identify specific pollutants, if known: silt and clay sediments, organic matter.

(iii) **Biological Characteristics. Wetland supports (check all that apply):**

Riparian buffer. Characteristics (type, average width):

Vegetation type/percent cover. Explain: Hardwood flat 100% cover.

Habitat for:

Federally Listed species. Explain findings:

Fish/spawn areas. Explain findings:

Other environmentally-sensitive species. Explain findings:

Aquatic/wildlife diversity. Explain findings: amphibians, crustaceans, birds, reptiles, mammals-sign or observed.

3. **Characteristics of all wetlands adjacent to the tributary (if any)**

All wetland(s) being considered in the cumulative analysis: **3**

Approximately (**6**) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>	<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>
y	1.5	y	3.5
y	1		

Summarize overall biological, chemical and physical functions being performed: Functions include flood storage, sediment retention, pollutant retention, carbon retention and contribution, nutrient recycling, wildlife habitat.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Wetland on the western portion of the property is adjacent to an unnamed man-made tributary (non-RPW) onsite. The man-made channel begins on the west side of Nancy drive, continues through the property and discharges directly into Middle Colyell Creek. Floodwater storage and sediment and pollution retention functions accrue in wetlands here; remaining pollutants enter the non-RPW and the RPW downstream. Carbon and organisms are also carried to the RPW from the wetland. Contributions of wetlands to the biological, chemical, and physical makeup of TNWs is well-documented in the literature (see references below). Physical characteristics on the site, including sediment deposits, rack lines (including organic material and organisms), scoured areas, water marks, etc., are evidence of both retention in the wetland and suspension of pollutants in the water column at the point where water exits the wetland. Given the number and intensity of rain and flow events in this region (greater than 60 days annually, with more than 0.1 inch rainfall), sediments, pollutants, carbon, and organisms in excess of the assimilative capacity of the RPWs will remain suspended in the water column long enough to reach the TNW. Thus the tributary, in combination with adjacent wetlands and other similarly situated wetlands, provide a direct and acute contribution to the chemical, physical, and biological makeup of the TNW. Further discussion is included in section IV.B.
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

- TNWs: linear feet width (ft), Or, acres.
- Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
- Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Offsite tributary is backed up and floods forested wetlands every few years, repeated observations of flow by residents.

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
 - Other non-wetland waters: acres.
- Identify type(s) of waters: .

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: **2700** linear feet **5-8** width (ft).
 - Other non-wetland waters: acres.
- Identify type(s) of waters: .

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .
 - Wetlands directly abutting an RPW where tributaries typically flow “seasonally.” Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: **6** acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- Demonstrate that impoundment was created from “waters of the U.S.,” or
- Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- Demonstrate that water is isolated with a nexus to commerce (see E below).

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

- which are or could be used by interstate or foreign travelers for recreational or other purposes.
- from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- which are or could be used for industrial purposes by industries in interstate commerce.
- Interstate isolated waters. Explain: .
- Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
Identify type(s) of waters: .
- Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps: .
- Corps navigable waters' study: .
- U.S. Geological Survey Hydrologic Atlas: .
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: Satsuma, LA.
- USDA Natural Resources Conservation Service Soil Survey. Citation: Soil Survey of Livingston Parish.
- National wetlands inventory map(s). Cite name: .
- State/Local wetland inventory map(s): .

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): 1998 IR, 2004 IR.
or Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify): USDA NRCS National Water and Climate Center Web Page.

Alexander, R.B., E.W. Boyer, R.A. Smith, G.E. Schwartz, and R.B. Moore, 2007. The Role of Headwater Streams in Downstream Water Quality. *Journal of the American Water Resources Association* 43. DOI: 10.1111/j.1752-1688.2007.00005.x.

Kappiella, Karen, and Lisa Fraley-McNeat. 2007. The Importance of Protecting Vulnerable Streams and Wetlands at the Local Level. *Wetlands and Watersheds Article #6*. Center for Watershed Protection. Elliot City, Maryland, for Office of Wetlands, Oceans, and Watersheds. U.S. Environmental Protection, Washington, D.C.

Meyer, Judy et al. 2003. *Where Rivers are Born: The Scientific Imperative for Defending Small Streams and Wetlands*. Sierra Club.

Mitsch, W.J., J.W. Day Jr, J.W. Gilliam, P.M. Groffman, D.L. Hey, G.W. Randall, and N. Wang, 2001. Reducing Nitrogen Loading to the Gulf of Mexico From the Mississippi River Basin: Strategies to Counter a Persistent Ecological Problem. *Bioscience* 51:373-388.

North Carolina Division of Water Quality (NCDWQ). 2006. *The Ecological and Water Quality Value of Headwater Wetlands in North Carolina*. North Carolina Division of Water Quality. Raleigh, North Carolina.

Saksa, Philip; Xu, Yi Jun; Stich, Richard Date: 2013 Hydrologic influence on sediment transport of low-gradient, forested headwater streams in central Louisiana In: Guldin, James M., ed. 2013. *Proceedings of the 15th biennial southern silvicultural research conference*. e-Gen. Tech. Rep. SRS-GTR-175. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 551-558. Station ID: Paper (invited, offered, keynote)-SRS-175

Tracie-Lynn Nadeau & Mark Cable Rains, *Hydrological Connectivity Between Headwater Streams and Downstream Waters: How Science Can Inform Policy*, 43(1) *J. AM. WATER RESOURCES ASS'N* 118-133 (2007)

Wipfli, M.S., J.S. Richardson, and R.J. Naiman, 2007. Ecological Linkages Between Headwaters and Downstream Ecosystems: Transport of Organic Matter, Invertebrates, and Wood Down Headwater Channels. *Journal of the American Water Resources Association* 43, DOI: 10.1111/j.1752-1688.2007.00007.x.

Zimmerman, R.J. and J.M. Nance, 2001. Effects of Hypoxia on the Shrimp Fishery of Louisiana and Texas. *Coastal and Estuarine Sciences* 58:293-310

B. ADDITIONAL COMMENTS TO SUPPORT JD: Wetlands on the western part of the property are part of a system of wetlands that historically flowed toward Hornsby Creek, but have been manipulated by excavated channels to drain directly to Middle Colyell Creek. These wetlands were likely more extensive on the property at one time. This channel flows from Nancy Drive and provides a direct connection to Middle Colyell Creek; Indications of flow from the wetland and conveyance was observed by MVN during site investigations.

Mosquitofish (*Gambusia* sp.) were present when water was present in the conveyance on the upstream and downstream sides of the one of the Nancy Drive culverts. This firmly establishes an aquatic connection and continuous surface water connection between the directly abutting wetland and the downstream system at various times since the mosquitofish would not be able to survive drier periods in the upper portions of the channel when inundation is absent for prolonged periods. Mosquitofish are live bearers and, as such, cannot be transported as eggs on the legs of birds or other mechanisms. The mosquitofish must have swum in a continuous water column into the conveyance on the subject property.

The non-RPW has enough active flow to support aquatic organisms, which would show the water column in the non-RPW extends up to the wetland on the property. The historic and recent hydrological connectivity between the wetland and the non-RPW is not speculative and is evidenced by live aquatic organisms in the non-RPW.

In spite of increased flow rates due to development and enhanced drainage in the area, the associated wetland system holds water back from the non-RPW and TNW) in a more positive respect. Regular high flows are adequate to suspend sediments and other particulates. When inundation is not present, indicators on the project site and in the non-RPW, including sediment deposits and water-stained leaves in the

wetland and scouring and deposition in the conveyances, demonstrate that sediments and pollutants are suspended in the water column at the point where the water exits the wetland and downstream in the tributary. When inundated, suspended sediments and organic matter were directly observed in the water column flowing from the wetland to the non-RPW. During relatively low flow periods, a portion of sediments and other pollutants will be assimilated by the tributary and associated wetland. During relatively higher flows, a portion of the pollutants will be re-disturbed and additional pollutants will be contributed to the non-RPW and the downstream system. Pollutants in excess of the assimilative capacity of the non-RPW and associated wetlands will flow directly to Middle Colyell.

Development in the area has increased flow rates and decreased beneficial functions of wetlands that contribute to the integrity of the downstream RPWs. In the context of the overall pollutant contributions to the receiving RPW and eventually the TNW, the effect of relatively unimpaired water from the wetland will be positive because it will help dilute sediments and other pollutants that are entering the relevant reach from properties downstream of the subject property.

The tributary and associated wetland in the subject watershed can impact the TNW adversely and beneficially. To the extent that the wetland, similarly situated wetland, and the tributary can withhold sediments, pollutants, carbon, and floodwater, this system collectively has a significant positive effect on the integrity of the TNW. Where portions of the system have been disturbed or removed, including channelization and clearing for development, the tributary and associated wetland will have less beneficial effects on the TNW due to reduced system functionality. Similarly, events that exceed the assimilative capacity of the system will have marked negative and/or positive effects on the downstream system. Thus, the tributary and associated wetlands have a significant nexus with the TNW.

The presence of sediment deposits in the tributary and associated wetlands demonstrates four functions accruing in the wetland that will affect the water quality of the TNW: floodwater storage, sediment retention, pollution retention, and organic carbon transport. In order for sediment deposits to be present in a wetland, flows from adjacent uplands and within the wetland itself were substantial enough to suspend silt and clay particles. This would also substantiate suspension of organic particulates within the size ranges that can be readily transported to downstream waters. Additionally, repeated direct observations of inundation and the presence of sediment deposits in the tributary and associated wetlands substantiate inundation in the tributary system. The duration is long enough for silt and clay sediments and organic carbon to fall out of suspension and to be sequestered by the wetland. This would also substantiate flood storage in the tributary and associated wetlands, which would directly affect the functionality of the downstream waters, based on general flow characteristics and potential assimilative capacities. In a parish averaging over 60 inches of precipitation per year, with events of 0.1" or greater occurring, on average, more than 20 days per year, saturation and flow from the wetland commonly occur on this site.

A number of birds, other wildlife sign including deer tracks, rabbit droppings, and raccoon tracks were observed traversing the property. The wetlands and tributary provide organic matter to food webs in Middle Colyell Creek and the downstream TNW. This is based on the observation of organic matter moving downstream that would provide carbon to the system as well as food and substrate for aquatic insects in the tributary and associated wetlands during periods of inundation. Aquatic insects observed in and supported by the wetlands and tributary provide food for fish in downstream waters.

The significant nexus between the TNW and the non-RPW and its associated wetlands has several facets. The entire Colyell Creek system and watershed has been impacted by development and the subsequent reduction in wetland functions. This fact increases the significance of every wetland that contributes positively to the aquatic ecosystem and water quality in the system and the TNW. Primarily, positive significant impacts accrue to the TNW from the tributary and associated wetlands, as well as wetlands throughout the watershed. Given the level of development in the area, all such wetlands become increasingly more important locally and thus have a significant impact on the physical, biological, and chemical integrity of the TNW. Importance is an ecological measure of the significance of the functions of the wetland within a prescribed area.

Residences along Nancy drive are not connected to a central sewer system, but have individual treatment systems. A number of the systems discharge effluent directly into the roadside ditch along the west side of Nancy Drive. Also, cattle are present on the west side of Nancy drive in fields that drain directly to the unnamed tributary. The effluent and cattle waste flow along Nancy Drive and through the channel on the property, including flow through wetlands on the west side of the property. Middle Colyell Creek and Hornsby Creek, on both sides of the site of the site and the entire Colyell Creek system are listed as impaired waters by EPA for primary recreational contact due to fecal coliform from onsite treatment systems. Additionally the Collyell Creek and its tributaries have in the past been impaired for primary fish and shellfish production due to Biological Oxygen Demand (BOD) and nutrients from similar sources. In the context of the overall pollutant contributions to the receiving RPW and eventually the TNW, the effect of relatively unimpaired water from the wetland will be positive because it will help dilute or sequester sewage effluent, sediments, and other pollutants that are entering the relevant reach from properties downstream of the subject property.

Middle Colyell Creek along the western edge of the property has been severely channelized and deeply cut by excavation and subsequent erosion. Middle Colyell Creek is subsequently severed from interaction with its floodplain and that assimilative capacity and attenuating influence. Floodplain functionality having been reduced to only overland sheetflow from adjacent uplands during each rain event, the main channel currently acts as a conduit, thereby allowing water to flow more quickly to the TNW. Due to the enhanced, accelerated flows in the main channel, turbidity and suspended pollutants remain in the water column longer, with more opportunity to reach the TNW more directly. This channelization increases the significance of the nexus between the TNW and the unnamed tributary and associated wetlands. It also increases the significance of the positive impacts from tributary and the remaining wetlands, including subject wetlands on the property.

The specific functions accruing in the tributary and associated wetlands include stormwater flow attenuation, short and long-term floodwater storage, nutrient retention and sequestration, sediment retention, and organic matter retention and sequestration, in addition to wildlife habitat. Several of these functions, including nutrient retention and organic matter retention, directly affect the manipulated nature of the downstream waters in the Ponchitalawa system. Short and long-term flood storage, sediment and organic matter retention, contribution to downstream food webs, and wildlife habitat functions were observed directly on the site by MVN.

Given its position on the landscape and its size, another of the subject wetland's major functions is stormwater runoff attenuation. The ability of the wetland to retain floodwater in a given event will enhance capacity of the tributary to accommodate accelerated flow from adjacent and downstream developed areas that have lost wetlands and stormwater attenuation previously associated with those wetlands. Furthermore, the floodwater storage function enables all the other functions in the wetland. Not only is stormwater flow attenuated during and after these events, but sediment deposition, organic matter, and other depositions occur because of the floodwater retention. These

functions in this wetland are critical to contributing relatively higher quality water into the manipulated systems of Middle Colyell Creek and Colyell Creek.

It is well established in the scientific literature that upper reach wetlands and waters play a significant role in the characteristics of the downstream waters (see references listed in Section IV. A above). The condition of any RPW or TNW is the sum of the condition of all the inputs from wetlands and tributaries that contribute flow into the RPW or TNW. "Alteration of small streams and wetlands disrupts the quantity and availability of water in a stream and river system." (Meyer et al., 2006).





















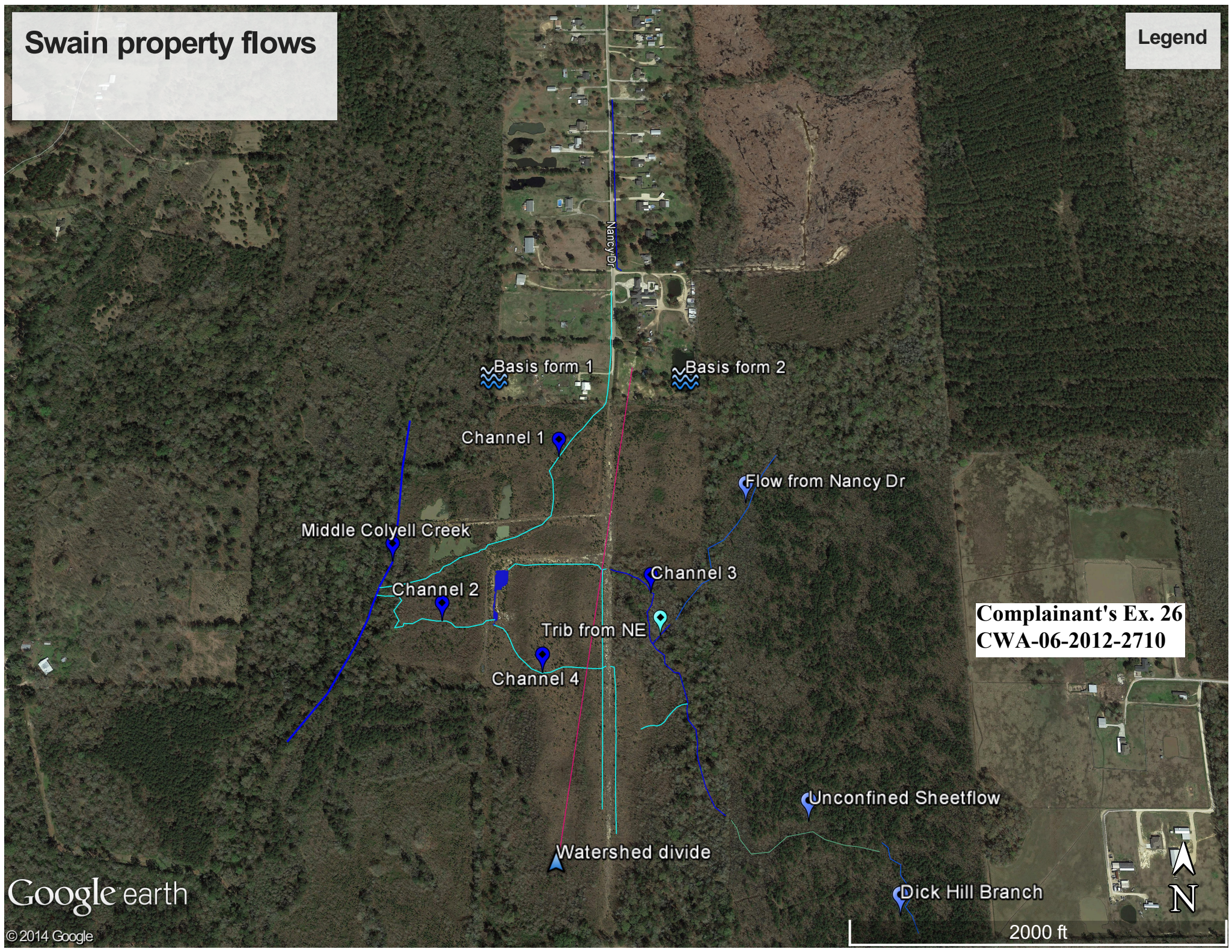






Swain property flows

Legend



**Complainant's Ex. 26
CWA-06-2012-2710**