

**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): 07/15/2016**

**B. DISTRICT OFFICE, FILE NAME, AND NUMBER:**

USACE Galveston District, SWG-2016-00356, Harris County Flood Control District Project ID Q700-01-00-Y001

**Features included within this Approved Jurisdictional Determination Form**  
**For the Q700-01-00-Y001 Project Area**

Field ID	Class <sup>1</sup>	Acres <sup>2</sup>
WET A1	PFO1 wetland	0.47
WET A2	PFO1 wetland	2.44
WET A3	PFO1 wetland	2.52
WET A4	PFO1 wetland	31.40
WET A5	PFO1 wetland	2.29
WET A6	PFO1 wetland	1.29
WET A7 <sup>3</sup>	PFO1 wetland	6.41
OW A1	Open-water	0.61
OW A2	Open-water	1.34
OW A3	Open-water	0.78
<b>TOTALS</b>	<b>PFO1 Wetland (7)</b>	<b>46.82</b>
	<b>Open-Water (3)</b>	<b>2.73</b>
	<b>All Features (10)</b>	<b>49.55</b>

- Atkins field classification based on Cowardin, et al. (1979):  
PFO1 = palustrine forested broad-leaved deciduous wetland
- Wetland and open-water acreages represent the total acreage identified within the project area.
- WET A7 was determined a wetland mosaic comprised of 60 percent wetland and 40 percent upland. The total acreage of WET A7 was multiplied by 60 percent to calculate the total wetland acreage present.

**C. PROJECT LOCATION AND BACKGROUND INFORMATION:**

State: Texas County/parish/borough: Harris County City: Crosby  
Center coordinates of site (lat/long in degree decimal format): Lat. 29.993619° N, Long. -95.016515° W  
Universal Transverse Mercator: Zone 15N

Name of nearest waterbody: Cedar Bayou

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Cedar Bayou

Name of watershed or Hydrologic Unit Code (HUC): North Galveston Bay Watershed HUC 12040203

- 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: 07/15/2016  
 Field Determination. Date(s): 06/30/2016

**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):<sup>1</sup>**

- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters<sup>2</sup> (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: 2.73 acres (OW A1, OW A2, OW A3).

Wetlands: 46.82 acres (WET A1, WET A2, WET A3, WET A4, WET A5, WET A6, WET A7).

See table provided under Section 1B

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

Elevation of established OHWM (if known): N/A

**2. Non-regulated waters/wetlands (check if applicable):<sup>3</sup>**

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

**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: N/A

Summarize rationale supporting determination: N/A

**2. Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is “adjacent”: N/A

**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 waterbody<sup>4</sup> 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

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

<sup>2</sup> 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).

<sup>3</sup> Supporting documentation is presented in Section III.F.

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

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: (HUC 12040203): 228399.53 acres  
 Drainage area: Cedar Bayou (USGS 08067500 Cedar Bayou near Crosby, Texas) 64.9 square miles  
 Average annual rainfall: 54.58 inches  
 Average annual snowfall: <0.1 inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

- Tributary flows directly into TNW.
- Tributary flows through Pick List tributaries before entering TNW.

Project waters are 5-10 river miles from TNW.  
 Project waters are 1 (or less) river miles from RPW.  
 Project waters are 2-5 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: N/A.

Identify flow route to TNW<sup>5</sup>: Flow is directly into the non-navigable portion of Cedar Bayou and flows approximately 6.5 river miles downstream from the project area before reaching portion of Cedar Bayou considered a TNW. Refer to Figure 2 in Attachment A for a depiction of the traditionally navigable portion of Cedar Bayou in relation to the location of the project area.

Tributary stream order, if known: 3

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

Tributary is:  Natural  
 Artificial (man-made). Explain:  
 Manipulated (man-altered). Explain: The portion of Cedar Bayou adjacent to the project area was channelized between 1953 and 1956, including the construction of dikes along either side of the relocated channel.

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

Average width: 25 feet  
 Average depth: 6 feet  
 Average side slopes: 3:1

Primary tributary substrate composition (check all that apply):

- Silts
- Sands
- Concrete
- Cobbles
- Gravel
- Muck
- Bedrock
- Vegetation.30/% cover: herbacious cover along banks
- Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Generally stable, however portions are experiencing erosion from heavy flow and flooding events.

Presence of run/riffle/pool complexes. Explain: N/A

Tributary geometry: Relatively straight

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

(c) Flow:

Tributary provides for: Seasonal flow  
 Estimate average number of flow events in review area/year: 20 (or greater)  
 Describe flow regime: Relatively permanent  
 Other information on duration and volume: Tributary is perennial

Surface flow is: Confined. Characteristics:

<sup>5</sup> 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.

The Cedar Bayou 100-year floodplain is broad in the area which the wetlands and openwater features are located. Cedar Bayou was channelized between 1953 and 1956 including the construction of dikes along either side of the relocated channel. Cedar Bayou itself exhibits a well-defined bed and bank. During heavy rainfall events, sheetflow from surrounding topography results in ponding of water within depressional areas. Flow between the tributary (Cedar Bayou) and the wetlands and open-water features is dependent on a series of culverts located within the dike adjacent to Cedar Bayou. Flow occurs during periods where water levels meet or exceed culvert elevations. Additionally, flow between Cedar Bayou and the wetlands and open-water features occurs during heavy flood events where water levels exceed bank elevations.

Subsurface flow: **Unknown**. Explain findings:

Dye (or other) test performed:

Tributary has (check all that apply):

- Bed and banks
- OHWM<sup>6</sup> (check all indicators that apply):
  - clear, natural line impressed on the bank
  - changes in the character of soil
  - shelving
  - vegetation matted down, bent, or absent
  - leaf litter disturbed or washed away
  - sediment deposition
  - water staining
  - other (list):
- Discontinuous OHWM.<sup>7</sup> Explain: .
- the presence of litter and debris
- destruction of terrestrial vegetation
- the presence of wrack line
- sediment sorting
- scour
- multiple observed or predicted flow events
- abrupt change in plant community

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

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

**(iii) Chemical Characteristics:**

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

Explain: Water is discolored and flow was discrete.

Identify specific pollutants, if known:

The portion of Cedar Bayou beginning at the confluence of Galveston Bay to approximately 1.4 miles upstream of Interstate Highway 10, is listed as impaired due to bacteria, dioxins in edible tissue, and PCB's in edible tissue. The portion of Cedar Bayou listed as impaired is located approximately 15 miles downstream from the project area.

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

- Riparian corridor. Characteristics (type, average width): N/A
- Wetland fringe. Characteristics:
- Habitat for:
  - Federally Listed species. Explain findings:
  - Fish/spawn areas. Explain findings: Holds water all year and fish were observed at time of survey.
  - Other environmentally-sensitive species. Explain findings:
  - Aquatic/wildlife diversity. Explain findings: Breeding habitat for amphibians

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

**(i) Physical Characteristics:**

**(a) General Wetland Characteristics:**

The wetlands listed in the table provided under Section IB are characterized as palustrine forested broad-leaved deciduous (PFO1) wetlands consisting of a dominate tree stratum with woody plants greater than 20 feet in height and 3 inches or greater in diameter at breast height. The PFO1 wetlands identified within the project area exhibited high species diversity within all vegetative strata, which is consistent with those communities commonly observed within historic floodplains neighboring perennial tributaries within the Atlantic and Gulf Coastal Plane Region. The described wetlands are considered medium quality due to the various anthropogenic effects

<sup>6</sup>A 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.

<sup>7</sup>Ibid.

including the manipulation of natural hydrology due to channelization of Cedar Bayou and colonization of invasive Chinese tallow (*Triadica sebifera*) within the project area.

Project wetlands cross or serve as state boundaries. Explain: N/A

(b) General Flow Relationship with Non-TNW:

Flow is: **Ephemeral flow**. Explain:

Wetlands are located within the 100-year floodplain of Cedar Bayou and flow occurs as a result of the accumulation of sheet-flow water from surrounding topography, overbanking of Cedar Bayou during flood events, and the presence of a series of culverts installed within the dike adjacent to Cedar Bayou. The culverts located within the dike create a direct hydrological connection allowing for the exchange of water between Cedar Bayou and the described wetlands and open water features during periods where water levels meet or exceed the elevation of the culverts. Evidence of both overbanking events and the exchange of water via culverts was apparent as wracking and sediment deposition was observed during field investigations.

Surface flow is: **Overland sheetflow**

Characteristics: Seasonal high water flooding and sheet-flow from surrounding topography.

Subsurface flow: **Unknown**. Explain findings: N/A.

Dye (or other) test performed: N/A

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting

Not directly abutting

Discrete wetland hydrologic connection. Explain: The wetlands and open-water features area located within the 100-year floodplain of Cedar Bayou and exhibits a hydrologic connection via overbanking events and the exchange of water through culverts.

Ecological connection. Explain:

Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **2-5** river miles from TNW.

Project waters are **2-5** aerial (straight) miles from TNW.

Flow is from: **Wetland to/from 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: Surface water (when present) within wetlands is discolored.

Identify specific pollutants, if known: Unknown.

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

Riparian buffer. Characteristics (type, average width):

Vegetation type/percent cover. Explain: PFO1 wetlands consisting of >30% aerial canopy coverage.

Habitat for:

Federally Listed species. Explain findings: N/A

Fish/spawn areas. Explain findings: N/A

Other environmentally-sensitive species. Explain findings: N/A

Aquatic/wildlife diversity. Explain findings: Large oaks provide habitat for neotropical migrants during spring and fall migrations.

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

All wetland(s) being considered in the cumulative analysis: **30 (or more)**

Approximately (5,220.71) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)

Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Refer to the table provided in Attachment B for the characteristics of all wetlands adjacent to the tributary being considered in this cumulative analysis.

Summarize overall biological, chemical and physical functions being performed:

The wetlands and open-water features included within this approved jurisdictional determination are situated adjacent to Cedar Bayou, a relatively permanent waterbody and a third order stream within this relevant reach analysis. The relevant reach of this portion of Cedar Bayou is approximately 32.7 river miles in length and consist of approximately 15.9 river miles of waterway considered traditionally navigable waters within the USACE Galveston District Regulatory Boundaries. Cedar Bayou considered a traditionally navigable water beginning approximately 5 miles south of Highway 90 to the Galveston Bay. The relevant reach begins approximately 2 linear miles northwest of Eastgate, Texas (approximately 8.6 miles upstream of project site) at the confluence of two unnamed tributaries, and ends approximately 0.25 miles northwest of the Highway 146 bridge crossing at the confluence of Cedar Bayou and Cary Bayou (approximately 24.1 miles downstream of the project site). The relevant reach is located within rapidly developing areas, areas currently used for agricultural practices, and relatively undisturbed forested riparian corridors.

Based on a review of National Wetlands Inventory data, Federal Emergency Management Agency Flood Maps, Flood Insurance Rate Maps, and Google Earth aerial imagery, 457 offsite adjacent wetlands totaling approximately 5,220.71 acres, were identified within this relevant reach analysis. Of the identified wetlands, 31 wetlands totaling approximately 967.72 acres are considered adjacent abutting wetlands within this relevant reach of Cedar Bayou. Of these adjacent abutting wetlands, approximately 1.37 acres are classified as estuarine emergent wetlands, 5.27 acres are classified as palustrine emergent wetlands, 937.45 acres as forested wetlands, and 23.63 acres as scrub-shrub wetlands. The remaining 426 wetlands totaling approximately 4,252.99 acres are considered adjacent non-abutting wetlands within this relevant reach of Cedar Bayou. Of these adjacent non-abutting wetlands, approximately 1,120.36 acres are classified as emergent wetlands, 2,636.28 acres as forested wetlands, and 496.35 acres as scrub-shrub wetlands. The adjacent abutting and adjacent non-abutting wetlands are located within both traditionally navigable and non-navigable portions of Cedar Bayou. Seven wetlands totaling 46.82 acres and three open-water features totaling 2.73 acres were identified within the project area. These wetlands and open-water features identified within the review area are determined to be adjacent, non-abutting features within this relevant reach of Cedar Bayou.

The United States Army Corps of Engineers Galveston District finds sufficient evidence and data to support the statement that the waters within this relevant reach of Cedar Bayou, and all similarly situated adjacent wetlands, provide more than a speculative or insubstantial effect upon the chemical integrity of traditionally navigable waters located both within and downstream of this relevant reach. There is a direct hydrologic connection between this approximate 32.7-mile relevant reach of Cedar Bayou and the nearest traditionally navigable waterway (Cedar Bayou). The approximate 5,220.71 acres of adjacent wetlands provide important filtration to reduce thermal and chemical pollutants flowing into Cedar Bayou as well as aid in the elimination and treatment of bacterial to traditionally navigable portions of Cedar Bayou located downstream. Portions of Cedar Bayou are identified by the Texas Commission of Environmental Quality as 303(d) impaired water for bacteria, dioxin in edible tissue, and PCBs in edible tissue. As such, wetlands within this reach aid in the removal of bacteria and chemical pollutants within these waterways. Therefore, it is the United States Army Corps of Engineers Galveston District's conclusion that the aquatic resources within this reach provide more than a speculative or insubstantial effect, that are inseparably bound to the chemical integrity of traditionally navigable waters located within, and downstream of this relevant reach.

Within this relevant reach of Cedar Bayou, there are approximately 5,220.71 acres of adjacent wetlands either directly abutting or non-abutting Cedar Bayou. Approximately 15.9 miles of Cedar Bayou located within the southern extent of this relevant reach are considered traditionally navigable waters. The retention of water associated with these adjacent wetlands is vital to maintain and protect physical integrity traditionally navigable waters located within, and downstream of this reach. Increased flow would result in the overbanking of natural and artificial containment structures causing flooding, erosion, property damage, and loss of physical attributes of traditionally navigable waters. Therefore, it is the United States Army Corps of Engineers Galveston District's conclusion that the aquatic resources within this reach provide more than a speculative or insubstantial effect, that are inseparably bound to maintain the physical integrity of traditionally navigable waters located within, and downstream of this relevant reach.

There are no species known to occur within this relevant reach that require the aquatic resources associated with the headwaters of Cedar Bayou, non-traditionally navigable portions of Cedar Bayou, traditionally navigable portions of Cedar Bayou, or the adjacent wetlands, to fulfill their life cycle requirements. Cedar Bayou is a relatively permanent waterbody and has direct hydrological connection to traditionally navigable waters. As such, it is likely that Cedar Bayou supports aquatic organisms that require both traditionally navigable waters as well as waters within this reach. It is likely that species of fishes and invertebrates utilize portions of Cedar Bayou and waters within this relevant reach to fulfill their life cycles, but there is insufficient evidence identifying specific species that require both the aquatic resources within this relevant reach as well as traditionally navigable waters to fulfill life cycle requirements. The adjacent abutting and non-abutting wetlands aid in providing species habitat, shelter from predators, and detritus and nutrients as a food source. Therefore, it is the United States Army Corps of Engineers Galveston District's conclusion that the aquatic resources within this relevant reach provide more than a speculative or insubstantial effect on traditionally navigable waters located within, and downstream of this relevant reach.

In conclusion, the United States Army Corps of Engineers Galveston District has determined that there is sufficient evidence to support the statement that the aquatic resources within this approximate 32.7-mile relevant reach of Cedar Bayou and its 5,220.71 acres of adjacent wetlands, provide more than a speculative or insubstantial effect to the chemical, physical, and biological integrity of traditionally navigable waters located within, and downstream (Cedar Bayou). As such, it is the United States Army Corps of Engineers Galveston District's opinion that this relevant reach of Cedar Bayou and its adjacent wetlands are waters of the United States subject to jurisdiction under Section 404 of the Clean Water Act.

### 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: N/A
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:

Three open-water features (OW A1, OW A2, and OWA3) were identified within the project area as adjacent non-abutting features to Cedar Bayou. These open-water features are located within the 100-year floodplain and share a significant nexus with non-navigable portions of Cedar Bayou via a series of culverts located within the dike adjacent to the project area. Flow occurs from these open-water features into non-navigable portions of Cedar Bayou to travel approximately 6.5 river miles downstream to traditionally navigable portions of Cedar Bayou. Additionally, flow between these open-water features and Cedar Bayou occurs during flood events when water level exceed bank elevations. These open-water features provide important filtration aiding in the elimination and treatment of thermal and chemical pollutants, and bacteria. The identified open-water features provide retention for floodwaters and reduce overbank flooding downstream. The retention of flood waters also reduces erosion, loss of property, and aids the preservation of physical attributes of traditionally navigable waters located downstream. The identified open-water features also support aquatic organisms by providing habitat, shelter from predators, and forage through the production of nutrients and detritus. As such, the United States Army Corps of Engineers Galveston District has determined that the described open-water features identified within the project area provide a more than a speculative or insubstantial effect on the chemical, physical, and biological integrity of traditional navigable waters (Cedar Bayou) located downstream.

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:

4.

Seven wetlands (WET A1, WET A2, WET A3, WET A4, WET A5, WET A6, and WET A7) were identified within the project area as adjacent, non-abutting wetlands to Cedar Bayou. The described wetlands are located within the 100-year floodplain and share a significant nexus with non-navigable portions of Cedar Bayou via a series of culverts located within the dike adjacent to the project area. Flow occurs from these wetlands into non-navigable portions of Cedar Bayou to travel approximately 6.5 river miles downstream to traditionally navigable portions of Cedar Bayou. Additionally, flow between these wetlands and Cedar Bayou occurs during flood events when water level exceed bank elevations. The described wetlands provide important filtration aiding in the elimination and treatment of thermal and chemical pollutants, and bacteria. These wetlands provide retention for floodwaters and reduce overbank flooding downstream. The retention of floodwaters also reduces erosion, loss of property, and aids the preservation of physical attributes of traditionally navigable waters located downstream. The identified wetlands also support aquatic organisms by providing habitat, shelter from predators, and forage through the production of nutrients and detritus. As such, the United States Army Corps of Engineers Galveston District has determined that the described wetlands provide a more than a speculative or insubstantial effect on the chemical, physical, and biological integrity of traditional navigable waters (Cedar Bayou) located downstream.

**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:

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-RPWs<sup>8</sup> 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: N/A linear feet width (ft).
- Other non-wetland waters: 2.73 acres.

Identify type(s) of waters:

OW A1, OW A2, and OW A3 are open-water features associated with the historic Cedar Bayou channel prior to its channelization and construction of dikes adjacent to the relocated channel.

**Non-RPWs that flow directly or indirectly into TNWs  
Identified Within the Q700-01-00-Y001 Project Area**

Field ID	Class <sup>1</sup>	Acres <sup>2</sup>
OW A1	Open-water	0.61
OW A2	Open-water	1.34
OW A3	Open-water	0.78
<b>TOTALS</b>	<b>Open-Water (3)</b>	<b>2.73</b>

1. Atkins field classification based on Cowardin, et al. (1979):  
OW = open-water
2. Open-water acreages represent the total acreage identified within the project area.

**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:

<sup>8</sup>See Footnote # 3.

**Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs  
Identified Within the Q700-01-00-Y001 Project Area**

Field ID	Class <sup>1</sup>	Acres <sup>2</sup>
WET A1	PFO1 wetland	0.47
WET A2	PFO1 wetland	2.44
WET A3	PFO1 wetland	2.52
WET A4	PFO1 wetland	31.40
WET A5	PFO1 wetland	2.29
WET A6	PFO1 wetland	1.29
WET A7 <sup>3</sup>	PFO1 wetland	6.41
<b>TOTALS</b>	<b>PFO1 Wetland (7)</b>	<b>46.82</b>

1. Atkins field classification based on Cowardin, et al. (1979):  
PFO1 = palustrine forested broad-leaved deciduous wetland
2. Wetland acreages represent the total acreage identified within the project area.
3. WET A7 was determined a wetland mosaic comprised of 60 percent wetland and 40 percent upland. The total acreage of WET A7 was multiplied by 60 percent to calculate the total wetland acreage present.

**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:            acres.

**7. Impoundments of jurisdictional waters.<sup>9</sup>**

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).

**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):<sup>10</sup>**

- 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):

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

<sup>10</sup> 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.

- 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: Atkins on behalf of Harris County Flood Control
- Data sheets prepared/submitted by or on behalf of the applicant/consultant. Atkins on behalf of Harris County Flood Control
  - 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: Navigable Waters within Galveston District Regulatory Boundaries
- 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: Crosby USGS 7.5 Minute Quadrangle Map
- USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name: Crosby Quadrangle- NWI notes wetlands within the review area. Wetland boundaries collected during field investigations are different than those included within the NWI dataset.
- State/Local wetland inventory map(s):
- FEMA/FIRM maps: 48201C0535L published 06/18/2007
- 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- Photographs:  Aerial (Name & Date): Bing Maps 2013  
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):

**B. ADDITIONAL COMMENTS TO SUPPORT JD:**

The wetlands and open-water features included within this approved jurisdictional determination are situated adjacent to Cedar Bayou, a relatively permanent waterbody and a third order stream within this relevant reach analysis. The relevant reach of this portion of Cedar Bayou is approximately 32.7 river miles in length and consist of approximately 15.9 river miles of waterway considered traditionally navigable waters within the USACE Galveston District Regulatory Boundaries. Cedar Bayou considered a traditionally navigable water beginning approximately 5 miles south of Highway 90 to the Galveston Bay. The relevant reach begins approximately 2 linear miles northwest of Eastgate, Texas (approximately 8.6 miles upstream of project site) at the confluence of two unnamed tributaries, and ends approximately 0.25 miles northwest of the Highway 146 bridge crossing at the confluence of Cedar Bayou and Cary Bayou (approximately 24.1 miles downstream of the project site). The relevant reach is located within rapidly developing areas, areas currently used for agricultural practices, and relatively undisturbed forested riparian corridors.

Based on a review of National Wetlands Inventory data, Federal Emergency Management Agency Flood Maps, Flood Insurance Rate Maps, and Google Earth aerial imagery, 457 offsite adjacent wetlands totaling approximately 5,220.71 acres, were identified within this relevant reach analysis. Of the identified wetlands, 31 wetlands totaling approximately 967.72 acres are considered adjacent abutting wetlands within this relevant reach of Cedar Bayou. Of these adjacent abutting wetlands, approximately 1.37 acres are classified as estuarine emergent wetlands, 5.27 acres are classified as palustrine emergent wetlands, 937.45 acres as forested wetlands, and 23.63 acres as scrub-shrub wetlands. The remaining 426 wetlands totaling approximately 4,252.99 acres are considered adjacent non-abutting wetlands within this relevant reach of Cedar Bayou. Of these adjacent non-abutting wetlands, approximately 1,120.36 acres are classified as emergent wetlands, 2,636.28 acres as forested wetlands, and 496.35 acres as scrub-shrub wetlands. The adjacent abutting and adjacent non-abutting wetlands are located within both traditionally navigable and non-navigable portions of Cedar Bayou. Seven wetlands totaling 46.82 acres and three open-water features totaling 2.73 acres were identified within the project area. These wetlands and open-water features identified within the review area are determined to be adjacent, non-abutting features within this relevant reach of Cedar Bayou.

The United States Army Corps of Engineers Galveston District finds sufficient evidence and data to support the statement that the waters within this relevant reach of Cedar Bayou, and all similarly situated adjacent wetlands, provide more than a speculative or insubstantial effect upon the chemical integrity of traditionally navigable waters located both within and downstream of this relevant reach. There is a direct hydrologic connection between this approximate 32.7-mile relevant reach of Cedar Bayou and the nearest traditionally navigable waterway

(Cedar Bayou). The approximate 5,220.71 acres of adjacent wetlands provide important filtration to reduce thermal and chemical pollutants flowing into Cedar Bayou as well as aid in the elimination and treatment of bacterial to traditionally navigable portions of Cedar Bayou located downstream. Portions of Cedar Bayou are identified by the Texas Commission of Environmental Quality as 303(d) impaired water for bacteria, dioxin in edible tissue, and PCBs in edible tissue. As such, wetlands within this reach aid in the removal of bacteria and chemical pollutants within these waterways. Therefore, it is the United States Army Corps of Engineers Galveston District's conclusion that the aquatic resources within this reach provide more than a speculative or insubstantial effect, that are inseparably bound to the chemical integrity of traditionally navigable waters located within, and downstream of this relevant reach.

Within this relevant reach of Cedar Bayou, there are approximately 5,220.71 acres of adjacent wetlands either directly abutting or non-abutting Cedar Bayou. Approximately 15.9 miles of Cedar Bayou located within the southern extent of this relevant reach are considered traditionally navigable waters. The retention of water associated with these adjacent wetlands is vital to maintain and protect physical integrity traditionally navigable waters located within, and downstream of this reach. Increased flow would result in the overbanking of natural and artificial containment structures causing flooding, erosion, property damage, and loss of physical attributes of traditionally navigable waters. Therefore, it is the United States Army Corps of Engineers Galveston District's conclusion that the aquatic resources within this reach provide more than a speculative or insubstantial effect, that are inseparably bound to maintain the physical integrity of traditionally navigable waters located within, and downstream of this relevant reach.

There are no species known to occur within this relevant reach that require the aquatic resources associated with the headwaters of Cedar Bayou, non-traditionally navigable portions of Cedar Bayou, traditionally navigable portions of Cedar Bayou, or the adjacent wetlands, to fulfill their life cycle requirements. Cedar Bayou is a relatively permanent waterbody and has direct hydrological connection to traditionally navigable waters. As such, it is likely that Cedar Bayou supports aquatic organisms that require both traditionally navigable waters as well as waters within this reach. It is likely that species of fishes and invertebrates utilize portions of Cedar Bayou and waters within this relevant reach to fulfill their life cycles, but there is insufficient evidence identifying specific species that require both the aquatic resources within this relevant reach as well as traditionally navigable waters to fulfill life cycle requirements. The adjacent abutting and non-abutting wetlands aid in providing species habitat, shelter from predators, and detritus and nutrients as a food source. Therefore, it is the United States Army Corps of Engineers Galveston District's conclusion that the aquatic resources within this relevant reach provide more than a speculative or insubstantial effect on traditionally navigable waters located within, and downstream of this relevant reach.

In conclusion, the United States Army Corps of Engineers Galveston District has determined that there is sufficient evidence to support the statement that the aquatic resources identified within the Q700-01-00-Y001 project area, located within this approximate 32.7-mile relevant reach of Cedar Bayou, and its 5,220.71 acres of adjacent wetlands, provide more than a speculative or insubstantial effect to the chemical, physical, and biological integrity of traditionally navigable waters located within, and downstream (Cedar Bayou). As such, it is the United States Army Corps of Engineers Galveston District's opinion that aquatic resources identified within this relevant reach of Cedar Bayou including its adjacent wetlands, are waters of the United States subject to jurisdiction under Section 404 of the Clean Water Act.

All Adjacent Wetlands Identified During Significant Nexus Determination

Refer to Attachment B for the characteristics of all adjacent wetlands included within this Significant Nexus Determination.

**Wetlands and Non-RPWs Identified in the Q700-01-00-Y001 Project Area**

Field ID	Class <sup>1</sup>	Acres <sup>2</sup>	Latitude, Longitude	UTM Northing, Easting <sup>4</sup>
WET A1	PFO1 wetland	0.47	29.992206, -95.02464	304692.4624, 3319647.153
WET A2	PFO1 wetland	2.44	29.990894, -95.006813	306409.8688, 3319471.485
WET A3	PFO1 wetland	2.52	29.988491, -95.006709	306415.2584, 3319204.909
WET A4	PFO1 wetland	31.40	29.994998, -95.018692	305271.7858, 3319946.471
WET A5	PFO1 wetland	2.29	29.992548, -95.00893	306208.8331, 3319658.35
WET A6	PFO1 wetland	1.29	29.994472, -95.022425	304910.5992, 3319894.58
WET A7 <sup>3</sup>	PFO1 wetland	6.41	29.993885, -95.024001	304757.3303, 3319832.187
OW A1	Open-water	0.61	29.99359, -95.012134	305901.7592, 3319779.266
OW A2	Open-water	1.34	29.992847, -95.006864	306408.7839, 3319687.991
OW A3	Open-water	0.78	29.99395, -95.014897	305635.8426, 3319823.89
<b>TOTALS</b>	<b>PFO1 Wetland (7)</b>	<b>46.82</b>		
	<b>Open-Water (3)</b>	<b>2.73</b>		
	<b>All Features (10)</b>	<b>49.55</b>		

1. Atkins field classification based on Cowardin, et al. (1979):  
PFO1 = palustrine forested broad-leaved deciduous wetland
2. Wetland and open-water acreages represent the total acreage identified within the project area.
3. WET A7 was determined a wetland mosaic comprised of 60 percent wetland and 40 percent upland. The total acreage of WET A7 was multiplied by 60 percent to calculate the total wetland acreage present.
4. UTM Northing and Easting coordinates are in UTM Zone 15.