FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 1

TERREBONNE PARISH, LOUISIANA

(ALL JURISDICTIONS)

COMMUNITY NAME	COMMUNITY NUMBER
TERREBONNE PARISH, CONSOLIDATED GOVERNMENT	225206

FEMA

EFFECTIVE:

September 7, 2023

FLOOD INSURANCE STUDY NUMBER
22109CV000A
Version Number 2.6.4.6

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FLOOD INSURANCE STUDY REPORT
TERREBONNE PARISH, LOUISIANA

SECTION 1.0 – INTRODUCTION

1.1 The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a voluntary Federal program that enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

For decades, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, sea-walls, and the like, and providing disaster relief to flood victims. This approach did not reduce losses nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, the public generally could not buy flood coverage from insurance companies, and building techniques to reduce flood damage were often overlooked.

In the face of mounting flood losses and escalating costs of disaster relief to the general taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances, and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection.

The U.S. Congress established the NFIP on August 1, 1968, with the passage of the National Flood Insurance Act of 1968. The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004. The NFIP is administered by the Federal Emergency Management Agency (FEMA), which is a component of the Department of Homeland Security (DHS).

Participation in the NFIP is based on an agreement between local communities and the Federal Government. If a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction and substantially improved structures in Special Flood Hazard Areas (SFHAs), the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The community's floodplain management regulations must meet or exceed criteria established in accordance with Title 44 Code of Federal Regulations (CFR) Part 60, *Criteria for Land Management and Use*.

SFHAs are delineated on the community's Flood Insurance Rate Maps (FIRMs). Under the NFIP, buildings that were built before the flood hazard was identified on the community's FIRMs are generally referred to as "Pre-FIRM" buildings. When the NFIP was created, the U.S. Congress recognized that insurance for Pre-FIRM buildings would be prohibitively expensive if the premiums were not subsidized by the Federal Government. Congress also recognized that most of these floodprone buildings were

built by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. The NFIP requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as "Post-FIRM" buildings.

1.2 Purpose of this Flood Insurance Study Report

This Flood Insurance Study (FIS) Report revises and updates information on the existence and severity of flood hazards for the study area. The studies described in this report developed flood hazard data that will be used to establish actuarial flood insurance rates and to assist communities in efforts to implement sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. Contact your State NFIP Coordinator to ensure that any higher State standards are included in the community's regulations.

1.3 Jurisdictions Included in the Flood Insurance Study Project

This FIS Report covers the entire geographic area of Terrebonne Parish, Louisiana.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the United States Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC-8) sub-basins affecting each, are shown in Table 1. The FIRM panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Terrebonne Parish, Consolidated Government	225206	08080101 08090302	22109C0025E 22109C0050E 22109C0075E 22109C0095E 22109C0100E 22109C0115E	

Table 1: Listing of NFIP Jurisdictions (continued)

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Terrebonne Parish, Consolidated Government	225206	08080101 08090302	22109C0125E 22109C0150E 22109C0175E 22109C0200E 22109C0225E 22109C0235E 22109C0245E 22109C0250E 22109C0251E 22109C0252E 22109C0253E 22109C0254E 22109C0260E 22109C0275E 22109C0300E 22109C0325E 22109C0350E 22109C0375E 22109C0400E 22109C0425E 22109C0450E 22109C0475E 22109C0500E 22109C0525E 22109C0550E 22109C0575E 22109C0600E 22109C0625E 22109C0650E 22109C0675E 22109C0700E 22109C0725E 22109C0750E 22109C0775E 22109C0800E 22109C0825E 22109C0850E 22109C0875E 22109C0900E[1] 22109C0925E[1] 22109C0950E 22109C0975E 22109C1000E 22109C1025E[1] 22109C1050E[1] 22109C1075E[1] 22109C1100E[1] 22109C1125E[1] 22109C1175E[1]	

[1] Panel Not Printed

1.4 Considerations for using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1-percent-annual-chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplains; and 1-percent-annual-chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 1, 2, and 3 present information that applies to using the FIRM with the FIS Report.

- Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report. Refer to Section 6.5 of this FIS Report for information about the process to revise the FIS Report and/or FIRM.

  It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 30, "Map Repositories," within this FIS Report.

- New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

  The initial Countywide FIS Report for Terrebonne Parish became effective on September 7, 2023 Refer to Table 27 for information about subsequent revisions to the FIRMs.

- Selected FIRM panels for the community may contain information (such as floodways and cross sections) that was previously shown separately on the corresponding Flood Boundary and Floodway Map (FBFM) panels. In addition, former flood hazard zone designations have been changed as follows:

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X (shaded)
C	X (unshaded)

- FEMA does not impose floodplain management requirements or special insurance ratings based on Limit of Moderate Wave Action (LiMWA) delineations at this time. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. If the LiMWA is shown on the FIRM, it is being provided by FEMA as information only. For communities that do adopt Zone VE building standards in the area defined by the LiMWA, additional Community Rating System (CRS) credits are available. Refer to Section 2.5.4 for additional information about the LiMWA.

  The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Visit the FEMA Web site at www.fema.gov/flood-insurance/rules-legislation/community-rating-system or contact your appropriate FEMA Regional Office for more information about this program.

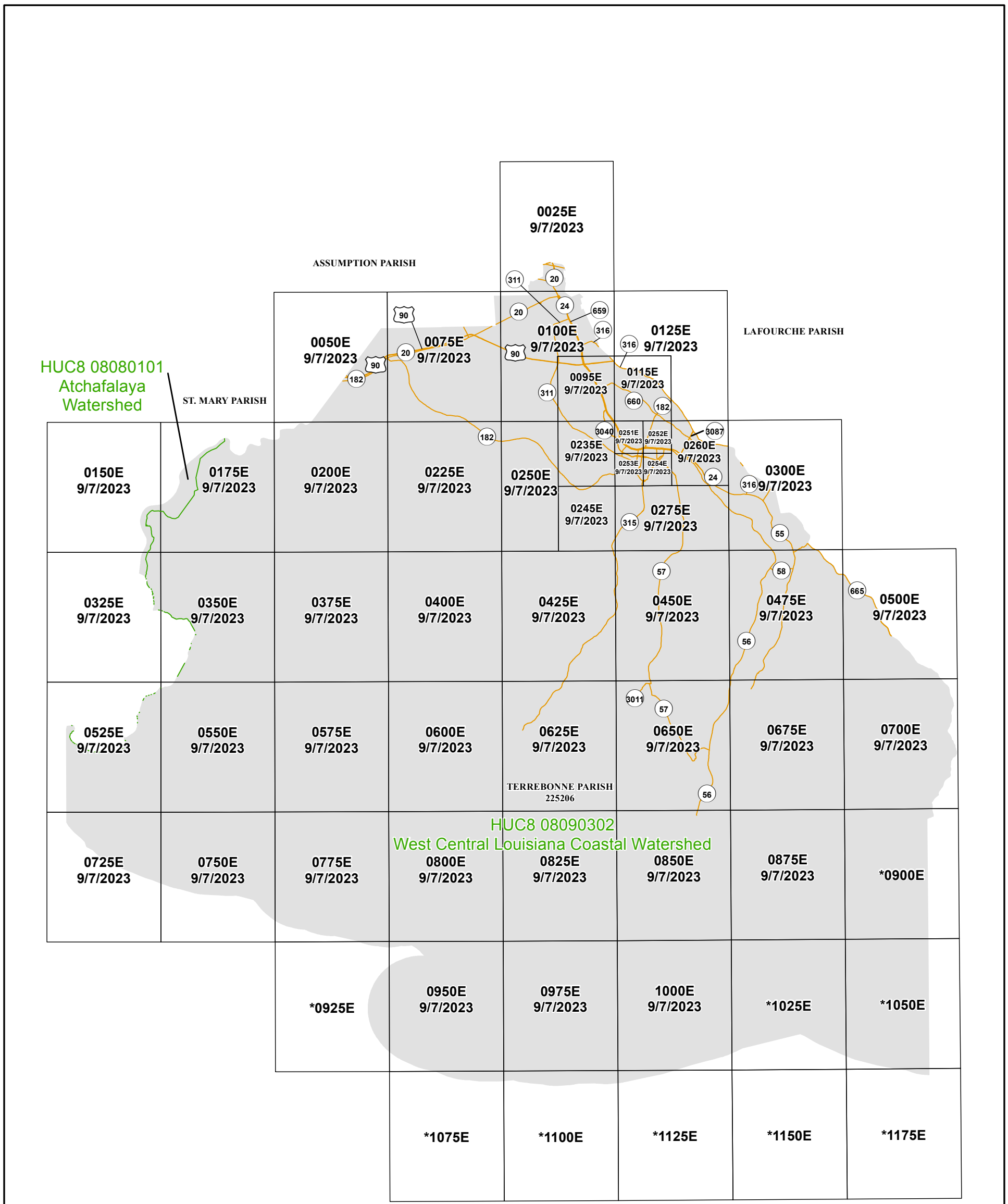
- Previous FIS Reports and FIRMs may have included levees that were accredited as reducing the risk associated with the 1-percent-annual-chance flood based on the information available and the mapping standards of the NFIP at that time. For FEMA to continue to accredit the identified levees, the levees must meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), titled "Mapping of Areas Protected by Levee Systems."

  Since the status of levees is subject to change at any time, the user should contact the appropriate agency for the latest information regarding levees presented in Table 8 of this FIS Report. For levees owned or operated by the U.S. Army Corps of Engineers (USACE), information may be obtained from the USACE National Levee Database (nld.usace.army.mil). For all other levees, the user is encouraged to contact the appropriate local community.

- FEMA has developed a *Guide to Flood Maps* (FEMA 258) and online tutorials to assist users in accessing the information contained on the FIRM. These include how to read panels and step-by-step instructions to obtain specific information. To obtain this guide and other assistance in using the FIRM, visit the FEMA Web site at www.fema.gov/flood-maps/tutorials.

The FIRM Index in Figure 1 shows the overall FIRM panel layout within Terrebonne Parish, and also displays the panel number and effective date for each FIRM panel in the county. Other information shown on the FIRM Index includes community boundaries, transportation features, watershed boundaries, and USGS HUC-8 codes.

Figure 1: FIRM Index



1 inch = 35,000 feet 1:420,000

Feet

0 17,500 35,000 70,000

Map Projection:
Lambert Conformal Conic State Plane Louisiana South Zone 1702; North American Datum 1983 Western Hemisphere; Vertical Datum: North American Vertical Datum of 1988

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - OPEN WATER AREA

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

TERREBONNE PARISH, LOUISIANA (All Jurisdictions)

PANELS PRINTED: 0025, 0050, 0075, 0095, 0100, 0115, 0125, 0150, 0175, 0200, 0225, 0235, 0245, 0250, 0251, 0252, 0253, 0254, 0260, 0275, 0300, 0325, 0350, 0375, 0400, 0425, 0450, 0475, 0500, 0525, 0550, 0575, 0600, 0625, 0650, 0675, 0700, 0725, 0750, 0775, 0800, 0825, 0850, 0875, 0950, 0975, 1000

FEMA

MAP NUMBER
22109CIND0A

EFFECTIVE DATE
SEPTEMBER 7, 2023

Each FIRM panel may contain specific notes to the user that provide additional information regarding the flood hazard data shown on that map. However, the FIRM panel does not contain enough space to show all the notes that may be relevant in helping to better understand the information on the panel. Figure 2 contains the full list of these notes.

Figure 2: FIRM Notes to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Mapping and Insurance eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Flood Map Service Center website or by calling the FEMA Mapping and Insurance eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 27 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Non-Coastal Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

Coastal Base Flood Elevations shown on the map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Coastal flood elevations are also provided in the Coastal Transect Parameters table in the FIS Report for this jurisdiction. Elevations shown in the Coastal Transect Parameters table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on the FIRM.

Figure 2: FIRM Notes to Users

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

PROJECTION INFORMATION: The projection used in the preparation of the map was State Plane Lambert Conformal Conic, Louisiana South Zone 1702. The horizontal datum was the North American Datum of 1983 NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

ELEVATION DATUM: Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov.

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 30 of this FIS Report.

BASE MAP INFORMATION: Base map information shown on the FIRM was derived from digital orthophotography collected by the U.S. Department of Agriculture Farm Service Agency. This imagery was flown in 2019 and was produced with a 1-meter ground sample distance. Additional base map information was obtained from the Louisiana Department of Transportation and Development, the Terrebonne Parish Communications District, and the U.S. Bureau of Land Management. For information about base maps, refer to Section 6.2 “Base Map” in this FIS Report.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Terrebonne Parish, Louisiana, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 27 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

Figure 2: FIRM Notes to Users

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Terrebonne Parish, Louisiana, effective September 7,2023

LIMIT OF MODERATE WAVE ACTION: Zone AE has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between Zone VE and the LiMWA (or between the shoreline and the LiMWA for areas where Zone VE is not identified) will be similar to, but less severe than, those in Zone VE.

NON-ACCREDITED LEVEE SYSTEM: This panel contains a levee system that has not been accredited and is therefore not recognized as reducing the 1-percentannual-chance flood hazard.

COASTAL BARRIER RESOURCES SYSTEM (CBRS): areas and "otherwise protected areas" (OPAs) are no longer shown on this map panel, but still may be present in this com m unity. Current information on these areas is provided by the U.S. Fish & Wildlife Service (FWS). NFIP flood insurance is not available within CBRS areas for structures that are built or substantially im proved on or after the dates indicated by FWS. Users should reference the most up-to-date information provided by FWS to determine NFIP insurance eligibility. The official maps and additional information regarding CBRS areas are provided on the FWS website at: www.fws.gov/cbra. FEMA also includes the official boundaries from FWS on our interactive and dynamic flood maps available through the FEMA Map Service Center.

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Terrebonne Parish.

Figure 3: Map Legend for FIRM

SPECIAL FLOOD HAZARD AREAS: The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.

	Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)
Zone A	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
Zone AE	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.
Zone AH	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
Zone AO	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
Zone AR	The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
Zone A99	The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
Zone V	The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
Zone VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.
	Regulatory Floodway determined in Zone AE.

Figure 3: Map Legend for FIRM

OTHER AREAS OF FLOOD HAZARD

Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.

Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.

Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood.

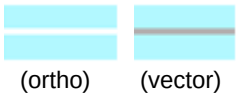
Area with Flood Risk due to Levee: Areas where a non-accredited levee, dike, or other flood control structure is shown as providing protection to less than the 1% annual chance flood.

OTHER AREAS

Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

Unshaded Zone X: Areas of minimal flood hazard.

FLOOD HAZARD AND OTHER BOUNDARY LINES



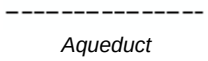
Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)

Limit of Study

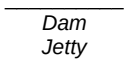
Jurisdiction Boundary

Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet

GENERAL STRUCTURES

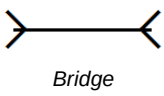


Channel, Culvert, Aqueduct, or Storm Sewer



Dam, Jetty, Weir

Levee, Dike, or Floodwall



Bridge

Figure 3: Map Legend for FIRM

REFERENCE MARKERS	
22.0	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
B 20.2	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
5280 21.1	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
8	Coastal Transect
	Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.
	Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.
513	Base Flood Elevation Line
ZONE AE (EL 16)	Static Base Flood Elevation value (shown under zone label)
ZONE AO (DEPTH 2)	Zone designation with Depth
ZONE AO (DEPTH 2) (VEL 15 FPS)	Zone designation with Depth and Velocity
BASE MAP FEATURES	
Missouri Creek	River, Stream or Other Hydrographic Feature
234	Interstate Highway
234	U.S. Highway
234	State Highway
234	County Highway
MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
RAILROAD	Railroad

Figure 3: Map Legend for FIRM

_____	Horizontal Reference Grid Line
⎯⎯	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
^{42}**76**^{000m}**E**	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16' 52.5"	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

Each flooding source included in the project scope has been studied and mapped using professional engineering and mapping methodologies that were agreed upon by FEMA and Terrebonne Parish as appropriate to the risk level. Flood risk is evaluated based on factors such as known flood hazards and projected impact on the built environment. Engineering analyses were performed for each studied flooding source to calculate its 1-percent-annual-chance flood elevations; elevations corresponding to other floods (e.g. 10-, 4-, 2-, 0.2-percent annual chance, etc.) may have also been computed for certain flooding sources. Engineering models and methods are described in detail in Section 5.0 of this FIS Report. The modeled elevations at cross sections were used to delineate the floodplain boundaries on the FIRM; between cross sections, the boundaries were interpolated using elevation data from various sources. More information on specific mapping methods is provided in Section 6.0 of this FIS Report.

Depending on the accuracy of available topographic data (Table 22), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1-percent and 0.2-percent-annual-chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1-percent-annual-chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM. Figure 3, “Map Legend for FIRM”, describes the flood zones that are used on the FIRMs to account for the varying levels of flood risk that exist along flooding sources within the project area. Table 2 and Table 3 indicate the flood zone designations for each flooding source and each community within Terrebonne Parish, respectively.

Table 2, “Flooding Sources Included in this FIS Report,” lists each flooding source, including its study limits, affected communities, mapped zone on the FIRM, and the completion date of its engineering analysis from which the flood elevations on the FIRM and in the FIS Report were derived. Descriptions and dates for the latest hydrologic and hydraulic analyses of the flooding sources are shown in Table 12. Floodplain boundaries for these flooding sources are shown on the FIRM (published separately) using the symbology described in Figure 3. On the map, the 1-percent-annual-chance floodplain corresponds to the SFHAs. The 0.2-percent-annual-chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. The procedures to remove these areas from the SFHA are described in Section 6.5 of this FIS Report.

Within this jurisdiction, there are one or more levees that have not been demonstrated by the communities or levee owners to meet the requirements of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10) as it relates to the levee's capacity to provide 1-percent-annual-chance flood protection. As such, the floodplain boundaries in this area are subject to change. Please refer to Section 4.4 of this FIS Report for more information on how this may affect the floodplain boundaries shown on this FIRM.

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Bayou Grand Caillou	Terrebonne Parish, Consolidated Government	Pumping Station	Approximately 200 feet upstream of Merrill Street	08090302	3.6	--	N	AE	2015
Gulf of Mexico	Terrebonne Parish, Consolidated Government	Entire Coastline	Entire Coastline	N/A	104.8	--	N	AE, VE	2010
Ouiski Bayou	Terrebonne Parish, Consolidated Government	Confluence with Little Bayou Black	Approximately 0.4 miles upstream of State Highway 311	08090302	9.7	--	N	AE	1979
Zone A Wetlands	Terrebonne Parish, Consolidated Government	Within Terrebonne Parish	Within Terrebonne Parish	08090302	--	25.2	N	A	1979

2.2 Floodways

This section is not applicable to this Flood Risk Project.

Figure 4: Floodway Schematic

[Not Applicable to this Flood Risk Project]

2.3 Base Flood Elevations

The hydraulic characteristics of flooding sources were analyzed to provide estimates of the elevations of floods of the selected recurrence intervals. The BFE is the elevation of the 1-percent-annual-chance flood. These BFEs are most commonly rounded to the whole foot, as shown on the FIRM, but in certain circumstances or locations they may be rounded to 0.1 foot. Cross section lines shown on the FIRM may also be labeled with the BFE rounded to 0.1 foot. Whole-foot BFEs derived from engineering analyses that apply to coastal areas, areas of ponding, or other static areas with little elevation change may also be shown at selected intervals on the FIRM.

BFEs are primarily intended for flood insurance rating purposes. Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. For example, the user may use the FIRM to determine the stream station of a location of interest and then use the profile to determine the 1-percent annual chance elevation at that location. Because only selected cross sections may be shown on the FIRM for riverine areas, the profile should be used to obtain the flood elevation between mapped cross sections. Additionally, for riverine areas, whole-foot elevations shown on the FIRM may not exactly reflect the elevations derived from the hydraulic analyses; therefore, elevations obtained from the profile may more accurately reflect the results of the hydraulic analysis.

2.4 Non-Encroachment Zones

This section is not applicable to this Flood Risk Project.

2.5 Coastal Flood Hazard Areas

For most areas along rivers, streams, and small lakes, BFEs and floodplain boundaries are based on the amount of water expected to enter the area during a 1-percent-annual-chance flood and the geometry of the floodplain. Floods in these areas are typically caused by storm events. However, for areas on or near ocean coasts, large rivers, or large bodies of water, BFE and floodplain boundaries may need to be based on additional components, including storm surges and waves.

Coastal flooding sources that are included in this Flood Risk Project are shown in Table 2.

2.5.1 Water Elevations and the Effects of Waves

Specific terminology is used in coastal analyses to indicate which components have been included in evaluating flood hazards.

The stillwater elevation (SWEL or still water level) is the surface of the water resulting from astronomical tides, storm surge, and freshwater inputs, but excluding wave setup contribution or the effects of waves.

- *Astronomical tides* are periodic rises and falls in large bodies of water caused by the rotation of the earth and by the gravitational forces exerted by the earth, moon and sun.
- *Storm surge* is the additional water depth that occurs during large storm events. These events can bring air pressure changes and strong winds that force water up against the shore.
- *Freshwater inputs* include rainfall that falls directly on the body of water, runoff from surfaces and overland flow, and inputs from rivers.

The 1-percent-annual-chance stillwater elevation is the stillwater elevation that has been calculated for a storm surge from a 1-percent-annual-chance storm. The 1-percent-annual-chance storm surge can be determined from analyses of tidal gage records, statistical study of regional historical storms, or other modeling approaches. Stillwater elevations for storms of other frequencies can be developed using similar approaches.

The total stillwater elevation (also referred to as the mean water level) is the stillwater elevation plus wave setup contribution but excluding the effects of waves.

- *Wave setup* is the increase in stillwater elevation at the shoreline caused by the reduction of waves in shallow water. It occurs as breaking wave momentum is transferred to the water column.

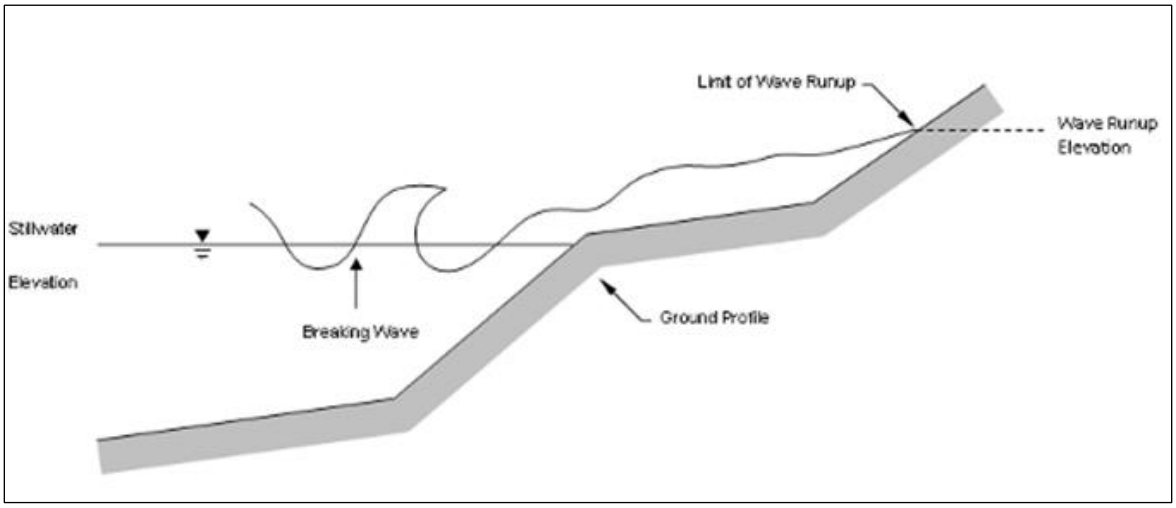
Like the stillwater elevation, the total stillwater elevation is based on a storm of a particular frequency, such as the 1-percent-annual-chance storm. Wave setup is typically estimated using standard engineering practices or calculated using models, since tidal gages are often sited in areas sheltered from wave action and do not capture this information.

Coastal analyses may examine the effects of overland waves by analyzing storm-induced erosion, overland wave propagation, wave runup, and/or wave overtopping.

- *Storm-induced erosion* is the modification of existing topography by erosion caused by a specific storm event, as opposed to general erosion that occurs at a more constant rate.
- *Overland wave propagation* describes the combined effects of variation in ground elevation, vegetation, and physical features on wave characteristics as waves move onshore.
- *Wave runup* is the uprush of water from wave action on a shore barrier. It is a function of the roughness and geometry of the shoreline at the point where the stillwater elevation intersects the land.

- *Wave overtopping* refers to wave runup that occurs when waves pass over the crest of a barrier.

Figure 5: Wave Runup Transect Schematic



2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

For coastal communities along the Atlantic and Pacific Oceans, the Gulf of Mexico, the Great Lakes, and the Caribbean Sea, flood hazards must take into account how storm surges, waves, and extreme tides interact with factors such as topography and vegetation. Storm surge and waves must also be considered in assessing flood risk for certain communities on rivers or large inland bodies of water.

Beyond areas that are affected by waves and tides, coastal communities can also have riverine floodplains with designated floodways, as described in previous sections.

Floodplain Boundaries

In many coastal areas, storm surge is the principle component of flooding. The extent of the 1-percent-annual-chance floodplain in these areas is derived from the total stillwater elevation (stillwater elevation including storm surge plus wave setup) for the 1-percent-annual-chance storm. The methods that were used for calculation of total stillwater elevations for coastal areas are described in Section 5.3 of this FIS Report. Location of total stillwater elevations for coastal areas are shown in Figure 8, “1% Annual Chance Total Stillwater Levels for Coastal Areas.”

In some areas, the 1-percent-annual-chance floodplain is determined based on the limit of wave runup or wave overtopping for the 1-percent-annual-chance storm surge. The methods that were used for calculation of wave hazards are described in Section 5.3 of this FIS Report.

Table 25 presents the types of coastal analyses that were used in mapping the 1-percent-annual-chance floodplain in coastal areas.

Coastal BFEs

Coastal BFEs are calculated as the total stillwater elevation (stillwater elevation including storm surge plus wave setup) for the 1-percent-annual-chance storm plus the additional flood hazard from overland wave effects (storm-induced erosion, overland wave propagation, wave runup and wave overtopping).

Where they apply, coastal BFEs are calculated along transects extending from offshore to the limit of coastal flooding onshore. Results of these analyses are accurate until local topography, vegetation, or development type and density within the community undergoes major changes.

Parameters that were included in calculating coastal BFEs for each transect included in this FIS Report are presented in Table 16, "Coastal Transect Parameters." The locations of transects are shown in Figure 9, "Transect Location Map." More detailed information about the methods used in coastal analyses and the results of intermediate steps in the coastal analyses are presented in Section 5.3 of this FIS Report. Additional information on specific mapping methods is provided in Section 6.4 of this FIS Report.

2.5.3 Coastal High Hazard Areas

Certain areas along the open coast and other areas may have higher risk of experiencing structural damage caused by wave action and/or high-velocity water during the 1-percent-annual-chance flood. These areas will be identified on the FIRM as Coastal High Hazard Areas.

- *Coastal High Hazard Area (CHHA)* is a SFHA extending from offshore to the inland limit of the primary frontal dune (PFD) or any other area subject to damages caused by wave action and/or high-velocity water during the 1-percent-annual-chance flood.

- *Primary Frontal Dune (PFD)* is a continuous or nearly continuous mound or ridge of sand with relatively steep slopes immediately landward and adjacent to the beach. The PFD is subject to erosion and overtopping from high tides and waves during major coastal storms.

CHHAs are designated as "V" zones (for "velocity wave zones") and are subject to more stringent regulatory requirements and a different flood insurance rate structure. The areas of greatest risk are shown as VE on the FIRM. Zone VE is further subdivided into elevation zones and shown with BFEs on the FIRM.

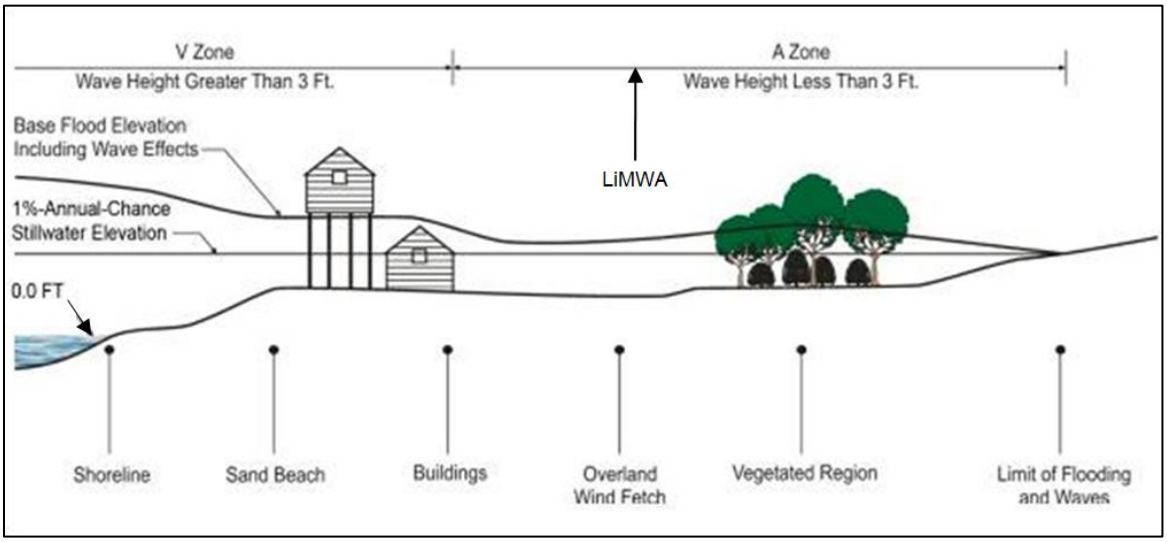
The landward limit of the PFD occurs at a point where there is a distinct change from a relatively steep slope to a relatively mild slope; this point represents the landward extension of Zone VE. Areas of lower risk in the CHHA are designated with Zone V on the FIRM. More detailed information about the identification and designation of Zone VE is presented in Section 6.4 of this FIS Report.

Areas that are not within the CHHA but are SFHAs may still be impacted by coastal flooding and damaging waves; these areas are shown as "A" zones on the FIRM.

Figure 6, "Coastal Transect Schematic," illustrates the relationship between the base flood elevation, the 1-percent-annual-chance stillwater elevation, and the ground profile

as well as the location of the Zone VE and Zone AE areas in an area without a PFD subject to overland wave propagation. This figure also illustrates energy dissipation and regeneration of a wave as it moves inland.

Figure 6: Coastal Transect Schematic



Methods used in coastal analyses in this Flood Risk Project are presented in Section 5.3 and mapping methods are provided in Section 6.4 of this FIS Report.

Coastal floodplains are shown on the FIRM using the symbology described in Figure 3, "Map Legend for FIRM." In many cases, the BFE on the FIRM is higher than the stillwater elevations shown in Table 16 due to the presence of wave effects. The higher elevation should be used for construction and/or floodplain management purposes.

2.5.4 Limit of Moderate Wave Action

Laboratory tests and field investigations have shown that wave heights as little as 1.5 feet can cause damage to and failure of typical Zone AE building construction. Wood-frame, light gage steel, or masonry walls on shallow footings or slabs are subject to damage when exposed to waves less than 3 feet in height. Other flood hazards associated with coastal waves (floating debris, high velocity flow, erosion, and scour) can also damage Zone AE construction.

Therefore, a LiMWA boundary may be shown on the FIRM as an informational layer to assist coastal communities in safe rebuilding practices. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The location of the LiMWA relative to Zone VE and Zone AE is shown in Figure 6.

The effects of wave hazards in Zone AE between Zone VE (or the shoreline where Zone VE is not identified) and the limit of the LiMWA boundary are similar to, but less severe than, those in Zone VE where 3-foot or greater breaking waves are projected to occur during the 1-percent-annual-chance flooding event. Communities are therefore encouraged to adopt and enforce more stringent floodplain management requirements

than the minimum NFIP requirements in the LiMWA. The NFIP Community Rating System provides credits for these actions.

SECTION 3.0 – INSURANCE APPLICATIONS

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones as described in Figure 3, "Map Legend for FIRM." Flood insurance zone designations are assigned to flooding sources based on the results of the hydraulic or coastal analyses. Insurance agents use the zones shown on the FIRM and depths and base flood elevations in this FIS Report in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

The 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (e.g. Zones A, AE, V, VE, etc.), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood insurance zones in Terrebonne Parish.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Terrebonne Parish, Consolidated Government	A, AE, AH, VE, X

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 4 contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

Table 4: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Atchafalaya	08080101	Atchafalaya River	Coastal subbasin along the Gulf of Mexico	3,090
West Central Louisiana Coastal	08090302	Gulf of Mexico	Coastal subbasin along the Gulf of Mexico	1,992

4.2 Principal Flood Problems

Table 5 contains a description of the principal flood problems that have been noted for Terrebonne Parish by flooding source.

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Bayou Chauvin	Localized flooding may occur along the flood plains of Bayou Chauvin.
Bayou Grand Caillou	Localized flooding may occur along the flood plains of Bayou Grand Caillou.
Gulf of Mexico	The past history of flooding within the City of Houma indicates that flooding may occur during any season of the year, but would most likely occur during the spring and fall months, when strong southerly winds or tropical storms cause high tides in the Gulf of Mexico. The low-lying unprotected areas of the City of Houma are subject to periodic flooding caused by hurricanes and tropical storms, or by rainfall runoff aggravated by high tides in the Gulf of Mexico.

Table 6 contains information about historic flood elevations in the communities within Terrebonne Parish.

Table 6: Historic Flooding Elevations

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)	Source of Data
Intracoastal Waterway	Terrebonne Parish, Consolidated Government	3.5	1971	20	NRCS high water marks
Intracoastal Waterway	Terrebonne Parish, Consolidated Government	4.0	1973	60	NRCS high water marks
Intracoastal Waterway	Terrebonne Parish, Consolidated Government	3.8	1974	20	NRCS high water marks
Intracoastal Waterway	Terrebonne Parish, Consolidated Government	4.1	1975	50	NRCS high water marks
Intracoastal Waterway	Terrebonne Parish, Consolidated Government	3.3	1976	20	NRCS high water marks
Intracoastal Waterway	Terrebonne Parish, Consolidated Government	3.8	1977	20	NRCS high water marks

4.3 Non-Levee Flood Protection Measures

Table 7 contains information about non-levee flood protection measures within Terrebonne Parish such as dams, jetties, and or dikes. Levees are addressed in Section 4.4 of this FIS Report.

Table 7: Non-Levee Flood Protection Measures

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
All flood sources	N/A	Pump station	Terrebonne Parish, Consolidated Government	Pumped drainage of developed or developing areas, with a low-lying portion of each protected area designated for temporary storage of excess runoff.

4.4 Levees

For purposes of the NFIP, FEMA only recognizes levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with comprehensive floodplain management criteria. The Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10) describes the information needed for FEMA to determine if a levee system reduces the risk from the 1-percent-annual-chance flood. This information must be supplied to FEMA by the community or other party when a flood risk study or restudy is conducted, when FIRMs are revised, or upon FEMA request. FEMA reviews the information for the purpose of establishing the appropriate FIRM flood zone.

Levee systems that are determined to reduce the risk from the 1-percent-annual-chance flood are accredited by FEMA. FEMA can also grant provisional accreditation to a levee system that was previously accredited on an effective FIRM and for which FEMA is awaiting data and/or documentation to demonstrate compliance with Section 65.10. These levee systems are referred to as Provisionally Accredited Levees, or PALs. Provisional accreditation provides communities and levee owners with a specified timeframe to obtain the necessary data to confirm the levee's certification status. Accredited levee systems and PALs are shown on the FIRM using the symbology shown in Figure 3 and in Table 8. If the required information for a PAL is not submitted within the required timeframe, or if information indicates that a levee system no longer meets Section 65.10, FEMA will de-accredit the levee system and issue an effective FIRM showing the levee-impacted area as a SFHA.

FEMA coordinates its programs with USACE, who may inspect, maintain, and repair levee systems. The USACE has authority under Public Law 84-99 to supplement local efforts to repair flood control projects that are damaged by floods. Like FEMA, the USACE provides a program to allow public sponsors or operators to address levee system maintenance deficiencies. Failure to do so within the required timeframe results in the levee system being placed in an inactive status in the USACE Rehabilitation and Inspection Program. Levee systems in an inactive status are ineligible for rehabilitation assistance under Public Law 84-99.

FEMA coordinated with the USACE, the local communities, and other organizations to compile a list of levees that exist within Terrebonne Parish. Table 8, "Levees," lists all accredited levees, PALs, and de-accredited levees shown on the FIRM for this FIS Report. Other categories of levees may also be included in the table. The Levee ID shown in this table may not match numbers based on other identification systems that

were listed in previous FIS Reports. Levees identified as PALs in the table are labeled on the FIRM to indicate their provisional status.

Please note that the information presented in Table 8 is subject to change at any time. For that reason, the latest information regarding any USACE structure presented in the table should be obtained by contacting USACE and accessing the USACE National Levee Database. For levees owned and/or operated by someone other than the USACE, contact the local community shown in Table 30.

Table 8: Levees

Community	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255042	No	22109C0253E 22109C0254E
Terrebonne Parish, Consolidated Government	Intracoastal Waterway	*	Terrebonne Levee and Conservation District	No	1604255039	No	22109C0252E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255035	No	22109C0235E 22109C0250E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255036	No	22109C0235E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255040	No	22109C0251E 22109C0252E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255041	No	22109C0254E 22109C0260E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255054	No	22109C0275E
Terrebonne Parish, Consolidated Government	Atchafalaya River	Left Bank	Terrebonne Levee and Conservation District	No	4404000561	No	22109C0175E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255003	No	22109C0425E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255004	No	22109C0425E 22109C0625E

Table 8: Levees (continued)

Community	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255005	No	22109C0425E 22109C0625E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255006	No	22109C0650E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255007	No	22109C0275E 22109C0300E 22109C0475E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255008	No	22109C0475E 22109C0500E 22109C0675E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255009	No	22109C0500E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255011	No	22109C0500E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255014	No	22109C0425E 22109C0450E 22109C0650E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255015	No	22109C0650E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255016	No	22109C0650E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255017	No	22109C0650E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255018	No	22109C0650E

Table 8: Levees (continued)

Community	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255019	No	22109C0650E 22109C0675E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255020	No	22109C0475E 22109C0500E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255021	No	22109C0500E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255022	No	22109C0075E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255023	No	22109C0075E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255024	No	22109C0075E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255025	No	22109C0075E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255026	No	22109C0075E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255027	No	22109C0075E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255028	No	22109C0075E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255029	No	22109C0075E

Table 8: Levees (continued)

Community	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255030	No	22109C0075E 22109C0100E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255031	No	22109C0075E 22109C0225E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255032	No	22109C0100E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255037	No	22109C0115E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255038	No	22109C0252E 22109C0260E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255043	No	22109C0275E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255044	No	22109C0275E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255045	No	22109C0450E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255046	No	22109C0425E 22109C0450E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255047	No	22109C0450E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255048	No	22109C0450E

Table 8: Levees (continued)

Community	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255049	No	22109C0450E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255050	No	22109C0650E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255051	No	22109C0650E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255052	No	22109C0475E 22109C0650E 22109C0675E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255053	No	22109C0475E 22109C0675E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255055	No	22109C0275E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255056	No	22109C0275E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255057	No	22109C0475E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255058	No	22109C0475E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255059	No	22109C0500E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604255060	No	22109C0475E 22109C0500E

Table 8: Levees (continued)

Community	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604995014	No	22109C0115E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	1604995017	No	22109C0260E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	300004009350	No	22109C0275E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	300004009355	No	22109C0450E
Terrebonne Parish, Consolidated Government	Gulf of Mexico	*	Terrebonne Levee and Conservation District	No	*	No	22109C0050E 22109C0075E 22109C0225E 22109C0235E 22109C0245E 22109C0250E 22109C0275E 22109C0425E 22109C0450E
Terrebonne Parish, Consolidated Government	Ouiski Bayou	*	Terrebonne Levee and Conservation District	No	1604255033	No	22109C0095E 22109C0100E 22109C0235E
Terrebonne Parish, Consolidated Government	Ouiski Bayou	*	Terrebonne Levee and Conservation District	No	1604255034	No	22109C0095E

*Data not available

SECTION 5.0 – ENGINEERING METHODS

For the flooding sources in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded at least once on the average during any 10-, 25-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance, respectively, of being equaled or exceeded during any year.

Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 12. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Bayou Grand Caillou	Pumping Station near Grand Caillou Road	0.84	610 / 600[1]	*	790 / 760[1]	890 / 860[1]	1,070 / 1,010[1]
Bayou Grand Caillou	Grand Caillou Road (Upper Crossing)	0.64	500 / 480[1]	*	650 / 590[1]	730 / 650[1]	870 / 760[1]
Bayou Grand Caillou	Oaklawn Drive	0.37	370 / 340[1]	*	460 / 380[1]	540 / 430[1]	670 / 490[1]
Bayou Grand Caillou	Hialeah Avenue	0.21	280	*	350	380	460
Bayou Grand Caillou	Jane Avenue	0.13	210	*	260	290	360
Bayou Grand Caillou	Cleveland Street	0.05	130	*	160	190	220
Ouiski Bayou	Confluence with Little Bayou Black	15.10	350[2]	*	570[2]	710[2]	1,080[2]
Ouiski Bayou	Station 50+00	14.00	2,170[2]	*	3,010[2]	3,450[2]	4,300[2]
Ouiski Bayou	Station 244+00	6.89	1,850[3]	*	2,500[3]	2,850[3]	3,540[3]
Ouiski Bayou	Station 445+00	2.76	1,350[3]	*	1,760[3]	1,970[3]	2,370[3]
Ouiski Bayou	Station 518+00	1.28	870[3]	*	1,040[3]	1,160[3]	1,270[3]
Ouiski Bayou	Station 530+00	1.13	1,300[3]	*	1,640[3]	1,820[3]	2,160[3]

*Not calculated for this Flood Risk Project

[1]Peak discharge adjusted for interbasin flow

[2]Routed flows from Ouiski Bayou storage area (above Bayou Cane)

[3]Routed flows from storage areas upstream of Louisiana Highway 20 embankment

Figure 7: Frequency Discharge-Drainage Area Curves

[Not Applicable to this Flood Risk Project]

Table 10: Summary of Non-Coastal Stillwater Elevations

[Not Applicable to this Flood Risk Project]

Table 11: Stream Gage Information used to Determine Discharges

[Not Applicable for this Flood Risk Project]

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Base flood elevations on the FIRM represent the elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations. These whole-foot elevations may not exactly reflect the elevations derived from the hydraulic analyses. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM.

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 12. Roughness coefficients are provided in Table 13. Roughness coefficients are values representing the frictional resistance water experiences when passing overland or through a channel. They are used in the calculations to determine water surface elevations. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

Table 12: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Bayou Grand Caillou	Pumping Station	Approximately 200 feet upstream of Merrill Street	*	Combined Probability Analysis	2015	AE	Combined probability analysis was calculated along Bayou Grand Caillou.
Ouiski Bayou	Confluence with Little Bayou Black	Approximately 0.4 miles upstream of State Highway 311	HEC-1	HEC-2	1979	AE	The HEC-1 computer model (USACE 1966) was used to route hydrographs through storage in the Ouiski Bayou Basin. Backwater computations were made using the HEC-2 backwater model (USACE 1961) along Ouiski Bayou from Little Bayou Black to Louisiana Highway 311 (near Schriever). The flood hazard information was redelineated based on newly developed topographic data in the initial countywide FIS. No new flood hazard analysis was performed.
Zone A Wetlands	Within Terrebonne Parish	Within Terrebonne Parish	*	*	1979	A	The flood hazard information was redelineated based on newly developed topographic data in the initial countywide FIS. No new flood hazard analysis was performed.

Table 13: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Bayou Grand Caillou	0.040	0.060
Ouiski Bayou	0.040	0.060-0.150

5.3 Coastal Analyses

For the areas of Terrebonne Parish that are impacted by coastal flooding processes, coastal flood hazard analyses were performed to provide estimates of coastal BFEs. Coastal BFEs reflect the increase in water levels during a flood event due to extreme tides and storm surge as well as overland wave effects.

The following subsections provide summaries of how each coastal process was considered for this FIS Report. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation. Table 14 summarizes the methods and/or models used for the coastal analyses. Refer to Section 2.5.1 for descriptions of the terms used in this section.

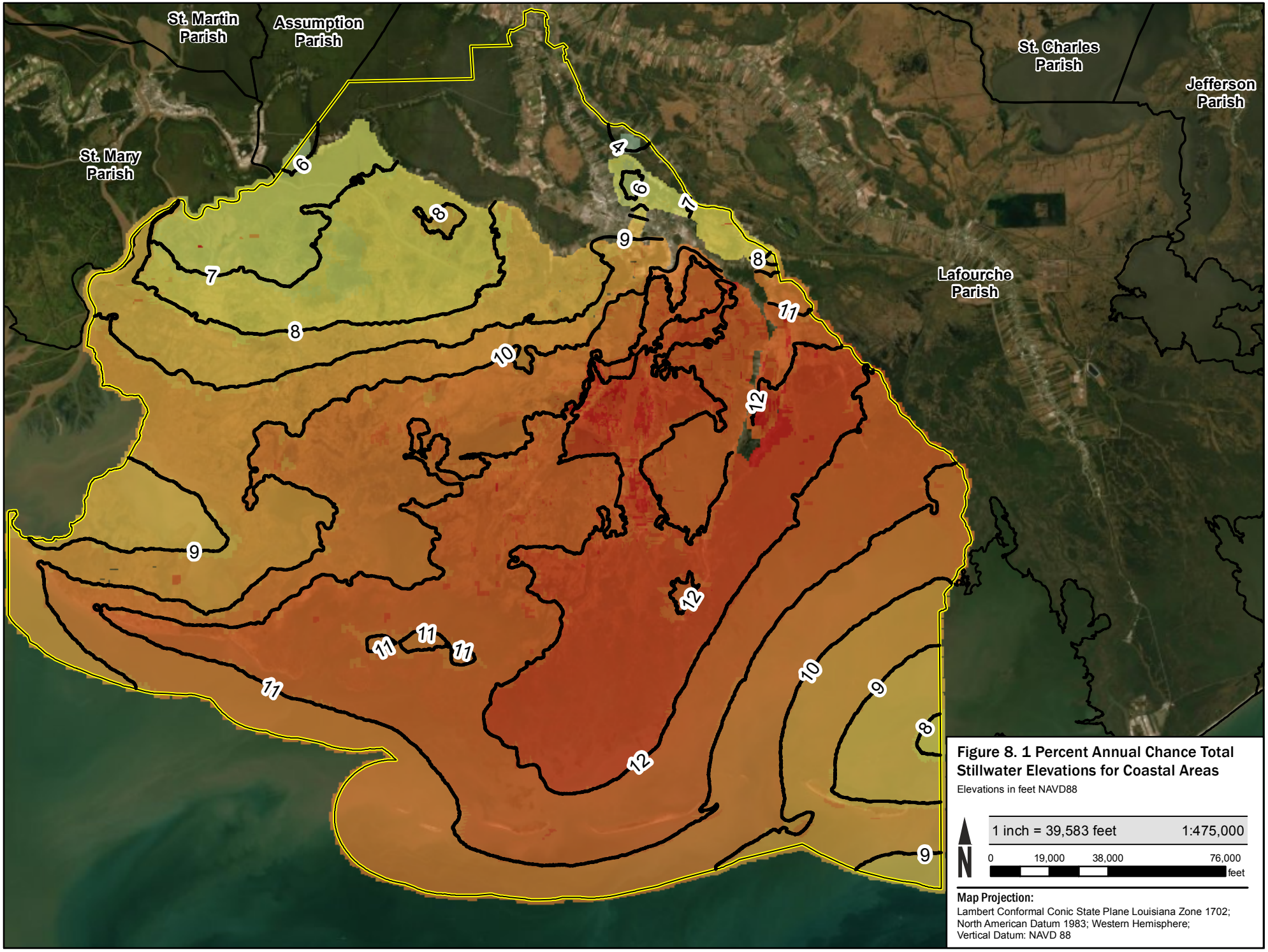
Table 14: Summary of Coastal Analyses

Flooding Source	Study Limits From	Study Limits To	Hazard Evaluated	Model or Method Used	Date Analysis was Completed
Gulf of Mexico	Entire coastline of Terrebonne Parish	Entire coastline of Terrebonne Parish	Storm Climatology Statistical Analyses	JPM-OS	06/30/2007
Gulf of Mexico	Entire coastline of Terrebonne Parish	Entire coastline of Terrebonne Parish	Storm Surge including Regional Wave Setup	ADCIRC + STWAVE	12/30/2007
Gulf of Mexico	Entire coastline of Terrebonne Parish	Entire coastline of Terrebonne Parish	Overland Wave Propagation	WHAFIS	07/20/2010
Gulf of Mexico	Entire coastline of Terrebonne Parish	Entire coastline of Terrebonne Parish	Wave Runup	Van Der Meer; SPM; TAW	07/20/2010

5.3.1 Total Stillwater Elevations

The total stillwater elevations (stillwater including storm surge plus wave setup) for the 1-percent-annual-chance flood were determined for areas subject to coastal flooding. The models and methods that were used to determine storm surge and wave setup are listed in Table 14. The stillwater elevation that was used for each transect in coastal analyses is shown in Table 16, "Coastal Transect Parameters." Figure 8 shows the total stillwater elevations for the 1-percent-annual-chance flood that was determined for this coastal analysis.

Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas



Astronomical Tide

Astronomical tidal statistics were generated directly from local tidal constituents by sampling the predicted tide at random times throughout the tidal epoch.

Storm Surge Statistics

Storm surge is modeled based on characteristics of actual storms responsible for significant coastal flooding. The characteristics of these storms are typically determined by statistical study of the regional historical record of storms or by statistical study of tidal gages.

When historic records are used to calculate storm surge, characteristics such as the strength, size, track, etc., of storms are identified by site. Storm data was used in conjunction with numerical hydrodynamic models to determine the corresponding storm surge levels. An extreme value analysis was performed on the storm surge modeling results to determine a stillwater elevation for the 1-percent-annual-chance event.

Flood estimates for the low frequency events were derived by simulating a large number of storm events using a coupling of hydrodynamic and wave models (i.e., the ADCIRC-ADvanced CIRCulation model and the STWAVE-Steady-state WAVE model). Key storm parameters (central pressure deficit, radius to maximum winds, forward speed, track heading, and the Holland's B parameter) were used to represent a population of historic and synthetic storm events. The Joint Probability Method with Optimal Sampling (JPM-OS), developed by Resio (Resio 2007) and Toro et. al. (Toro 2010), was applied to compute Stillwater Elevations (SWELs), which include the storm surge component and the wave setup component.

Tidal gages can be used instead of historic records of storms when the available tidal gage record for the area represents both the astronomical tide component and the storm surge component. Table 15 provides the gage name, managing agency, gage type, gage identifier, start date, end date, and statistical methodology applied to each gage used to determine the stillwater elevations. For Terrebonne Parish, LA, tidal gage records were not utilized for this Flood Risk project.

Table 15: Tide Gage Analysis Specifics

[Not Applicable to this Flood Risk Project]

Combined Riverine and Tidal Effects

A combined rate of occurrence analysis was conducted to compute a 1-percent-annual-chance BFE for areas subject to flooding by both coastal and riverine flooding mechanisms. Since riverine and coastal analyses were based on independent events, the resulting combined BFE would be higher than that of their individual occurrence. In other words, at the location where the computed 1-percent-annual-chance coastal flood level equals the computed 1-percent-annual-chance riverine flood level, there was a greater than 1-percent-annual-chance of this flood level being equaled or exceeded.

In Terrebonne Parish, combined joint probability calculations were performed for Bayou Grand Caillou.

Wave Setup Analysis

Wave setup was computed during the storm surge modeling through the methods and models listed in Table 14 and included in the frequency analysis for the determination of the total stillwater elevations.

5.3.2 Waves

Offshore wave conditions were modeled as part of the regional hydrodynamic and wave modeling (ADCIRC + STWAVE). The regional model results provided valuable information on the wave conditions that could be expected to occur during the types of extreme storm events that would produce storm surge elevations with 1- and 0.2-percent-annual-chance probabilities of occurrence. Wave heights and periods derived from the STWAVE model results were used as inputs to the wave hazard analyses described in Section 5.3.4.

5.3.3 Coastal Erosion

A single storm episode can cause extensive erosion in coastal areas. Storm-induced erosion was evaluated to determine the modification to existing topography that is expected to be associated with flooding events. Erosion was evaluated using the methods listed in Table 14. The post-event eroded profile was used for the subsequent transect-based onshore wave hazard analyses.

5.3.4 Wave Hazard Analyses

Overland wave hazards were evaluated to determine the combined effects of ground elevation, vegetation, and physical features on overland wave propagation and wave runup. These analyses were performed at representative transects along all shorelines for which waves were expected to be present during the floods of the selected recurrence intervals. The results of these analyses were used to determine elevations for the 1-percent-annual-chance flood.

Transect locations were chosen with consideration given to the physical land characteristics as well as development type and density so that they would closely represent conditions in their locality. Additional consideration was given to changes in the total stillwater elevation. Transects were spaced close together in areas of complex topography and dense development or where total stillwater elevations varied. In areas having more uniform characteristics, transects were spaced at larger intervals. Transects shown in Figure 9, “Transect Location Map,” are also depicted on the FIRM. Table 16 provides the location, stillwater elevations, and starting wave conditions for each transect evaluated for overland wave hazards. In this table, “starting” indicates the parameter value at the beginning of the transect.

Wave Height Analysis

Wave height analyses were performed to determine wave heights and corresponding wave crest elevations for the areas inundated by coastal flooding and subject to overland wave propagation hazards. Refer to Figure 6 for a schematic of a coastal transect evaluated for overland wave propagation hazards.

Wave heights and wave crest elevations were modeled using the methods and models listed in Table 14, “Summary of Coastal Analyses”. The 0.2-percent-annual-chance event, wave profiles were not produced for this Flood Risk project.

Wave Runup Analysis

Wave runup analyses were performed to determine the height and extent of runup beyond the limit of stillwater inundation for the 1-percent-annual-chance flood. Wave runup elevations were modeled using the methods and models listed in Table 14.

Table 16: Coastal Transect Parameters

Flood Source	Coastal Transect	Engineering Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
			Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Gulf of Mexico	1	1	3.4	10.1	6.1 *	* *	8.7 *	10.6 8.6 - 10.6	13.3 11.2 - 15.3
Gulf of Mexico	2	2	3.6	10.6	6.7 *	* *	9.4 *	11.3 6.7 - 11.3	14.4 9.6 - 14.9
Gulf of Mexico	3	3	3.6	10.2	6.7 *	* *	9.3 *	11.3 6.6 - 11.4	14.7 9.4 - 14.9
Gulf of Mexico	4	4	3.6	10.1	6.6 *	* *	9.4 *	11.3 0 - 11.3	14.8 2.8 - 15.1
Gulf of Mexico	5	5	3.8	10.8	6.5 *	* *	9.6 *	11.3 2.1 - 11.4	15.0 2.6 - 15.5
Gulf of Mexico	6	6	4.1	10.7	6.5 *	* *	9.9 *	11.6 2.0 - 11.6	14.9 2.3 - 16.2
Caillou Bay	7	6.5	4.3	11.4	* *	* *	* *	11.5 7.2 - 11.5	* *
Caillou Bay	8	7	4.4	12.0	6.4 *	* *	9.7 *	11.7 2.9 - 11.8	14.9 2.3 - 16.2
Caillou Bay	9	7.5	4.5	12.7	* *	* *	* *	11.9 12.5 - 2.7	* *
Caillou Bay	10	8	4.5	13.4	6.4 *	* *	10.1 *	12.2 2.7 - 12.2	15.2 0.0 - 16.2
Caillou Bay	11	8.25	4.6	14.0	* *	* *	* *	11.4 2.0 - 12.3	* *

Table 16: Coastal Transect Parameters (continued)

Flood Source	Coastal Transect	Engineering Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
			Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Caillou Bay	12	8.5	4.8	14.1	* *	* *	* *	11.7 1.9 - 12.4	* *
Caillou Bay	13	8.75	4.8	14.1	* *	* *	* *	11.9 2.7 - 12.6	* *
Terrebonne Bay	14	9	5.0	14.1	6.8 *	* *	10.3 *	12.4 0.0 - 12.6	15.3 0.0 - 18.0
Terrebonne Bay	15	9.3	5.2	14.1	* *	* *	* *	12.3 7.9 - 12.8	* *
Terrebonne Bay	16	9.6	5.3	14.5	* *	* *	* *	12.4 2.4 - 12.6	* *
Terrebonne Bay	17	10	5.3	14.8	7.1 *	* *	10.6 *	12.5 0.0 - 12.5	15.4 0.0 - 19.7
Terrebonne Bay	18	10.25	5.2	10.7	* *	* *	* *	12.4 2.6 - 12.8	* *
Terrebonne Bay	19	10.5	5.1	10.7	* *	* *	* *	12.2 2.0 - 13.4	* *
Terrebonne Bay	20	10.75	5.1	10.6	* *	* *	* *	12.1 1.9 - 12.6	* *
Terrebonne Bay	21	11	5.1	10.3	7.2 *	* *	10.4 *	12.3 0.0 - 12.4	15.2 0.0 - 16.8
Terrebonne Bay	22	11.5	5.2	10.3	* *	* *	* *	12.0 1.4 - 12.6	* *
Terrebonne Bay	23	12	5.5	9.9	7.2 *	* *	10.2 *	12.2 2.1 - 12.4	15.2 0.0 - 17.0

Table 16: Coastal Transect Parameters (continued)

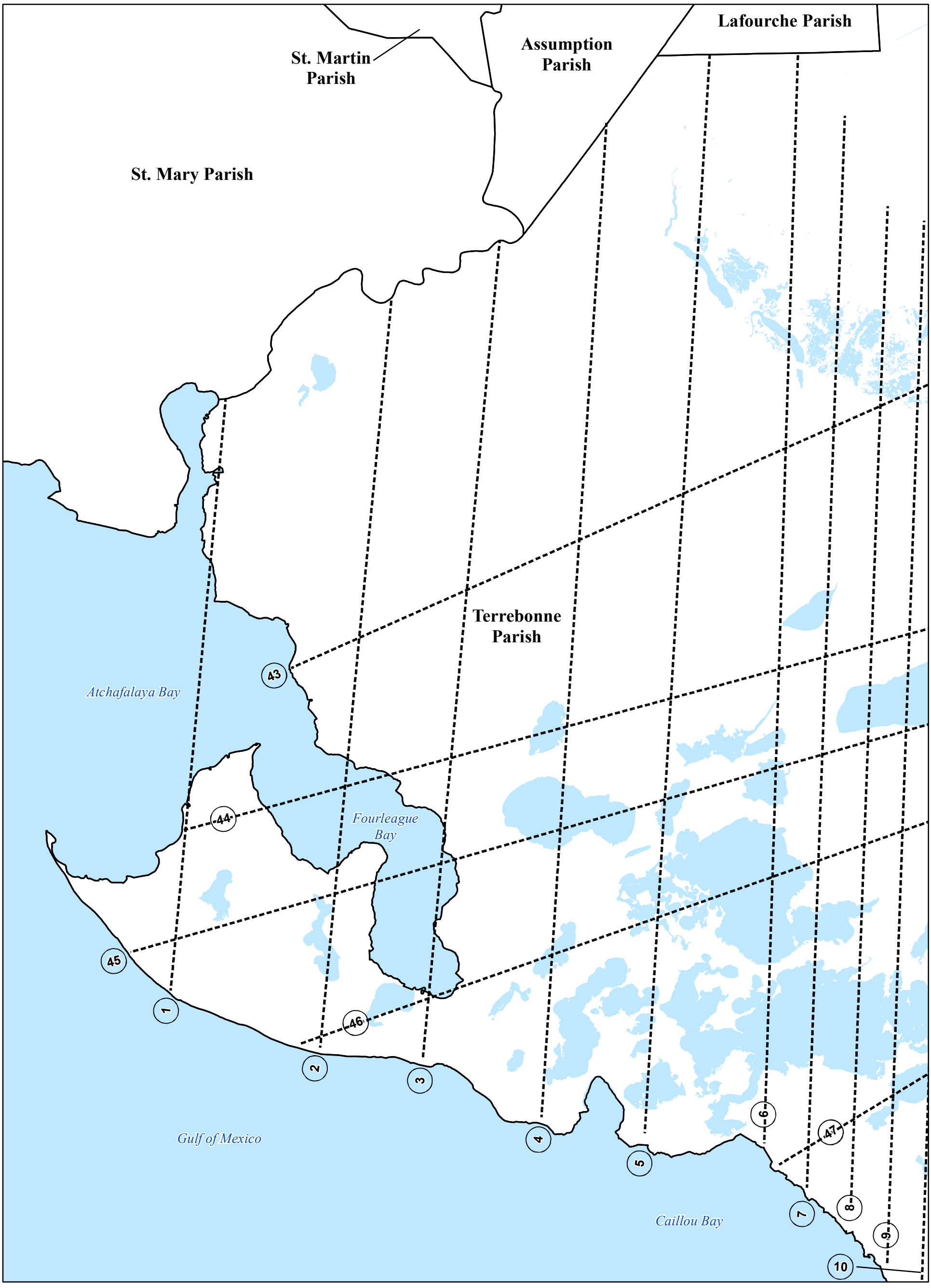
Flood Source	Coastal Transect	Engineering Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
			Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Terrebonne Bay	24	12.25	5.8	8.7	* *	* *	* *	12.5 1.6 - 12.5	* *
Terrebonne Bay	25	12.5	5.7	8.6	* *	* *	* *	12.4 1.3 - 12.7	* *
Terrebonne Bay	26	12.75	5.7	8.6	* *	* *	* *	12.4 1.6 - 12.9	* *
Terrebonne Bay	27	13	5.8	8.1	6.8 *	* *	9.8 *	12.2 0.0 - 12.4	15.2 0.0 - 21.5
Terrebonne Bay	28	13.3	5.8	7.9	* *	* *	* *	12.3 1.5 - 12.7	* *
Terrebonne Bay	29	13.6	5.7	7.8	* *	* *	* *	12.2 0.3 - 13.1	* *
Terrebonne Bay	30	14	5.8	8.1	7.1 *	* *	9.9 *	12.1 0.0 - 13.3	15.3 0.0 - 18.9
Terrebonne Bay	31	14.3	5.7	7.9	* *	* *	* *	11.9 2.5 - 13.5	* *
Terrebonne Bay	32	14.6	5.6	7.7	* *	* *	* *	11.7 2.4 - 12.7	* *
Terrebonne Bay	33	15	5.5	7.5	6.6 *	* *	9.6 *	11.8 0.0 - 12.4	15.0 0.0 - 16.9
Terrebonne Bay	34	15.5	5.4	7.4	* *	* *	* *	11.2 0.7 - 12.6	* *
Terrebonne Bay	35	16	5.3	9.0	6.2 *	* *	9 *	10.9 2.1 - 12.0	14.0 2.5 - 16.1

Table 16: Coastal Transect Parameters (continued)

Flood Source	Coastal Transect	Engineering Transect	Starting Wave Conditions for the 1% Annual Chance		Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88)				
			Significant Wave Height H_s (ft)	Peak Wave Period T_p (sec)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Terrebonne Bay	36	16.5	5.4	9.7	* *	* *	* *	11.3 4.6 - 11.9	* *
Terrebonne Bay	37	17	5.3	9.0	6.2 *	* *	9.0 *	11.1 3.7 - 11.6	14.2 2.2 - 16.5
Terrebonne Bay	38	17.5	5.2	8.0	* *	* *	* *	10.6 5.8 - 11.8	* *
Timbalier Bay	39	18	4.7	9.1	5.6 *	* *	8.3 *	10.2 5.2 - 11.3	13.2 7.7 - 17.4
Terrebonne Bay	40	19	5.3	9.0	* *	* *	* *	11 10.5 - 13.1	* *
Terrebonne Bay	41	20	5.5	9.0	* *	* *	* *	11.3 8.7 - 13.6	* *
Timbalier Bay	42	21	5.0	8.8	* *	* *	* *	10.4 2.4 - 12.6	* *
Atchafalaya Bay	43	TW2	6.9	9.0	8.3 *	* *	* *	9.3 2.7 - 9.5	* *
Atchafalaya Bay	44	TW4	11.4	11.2	8.6 *	* *	* *	8.4 8.4 - 11.2	* *
Gulf of Mexico	45	TW6	11.5	11.3	8.6 *	* *	* *	10.2 8.8 - 11.0	* *
Gulf of Mexico	46	TW7	11.7	11.4	8.4 *	* *	* *	11.2 9.6 - 12.0	* *
Caillou Bay	47	TW8	9.9	10.7	8.0 *	* *	* *	11.4 11.0 - 12.8	* *

*Not calculated for this Flood Risk Project

Figure 9: Transect Location Map



1 inch = 16,667 feet 1:200,000

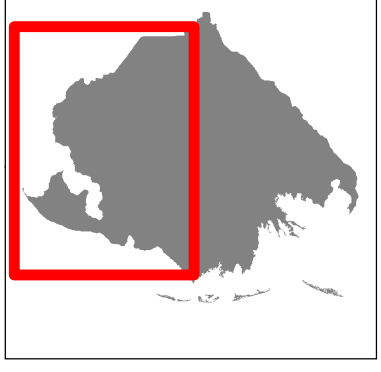
N

Feet
0 4,450 8,900 17,800 26,700 35,600

Map Projection:

Lambert Conformal Conic State Plane Louisiana Zone 1702; North American Datum 1983; Western Hemisphere; Vertical Datum: North American Vertical Datum of 1988

COUNTY LOCATOR



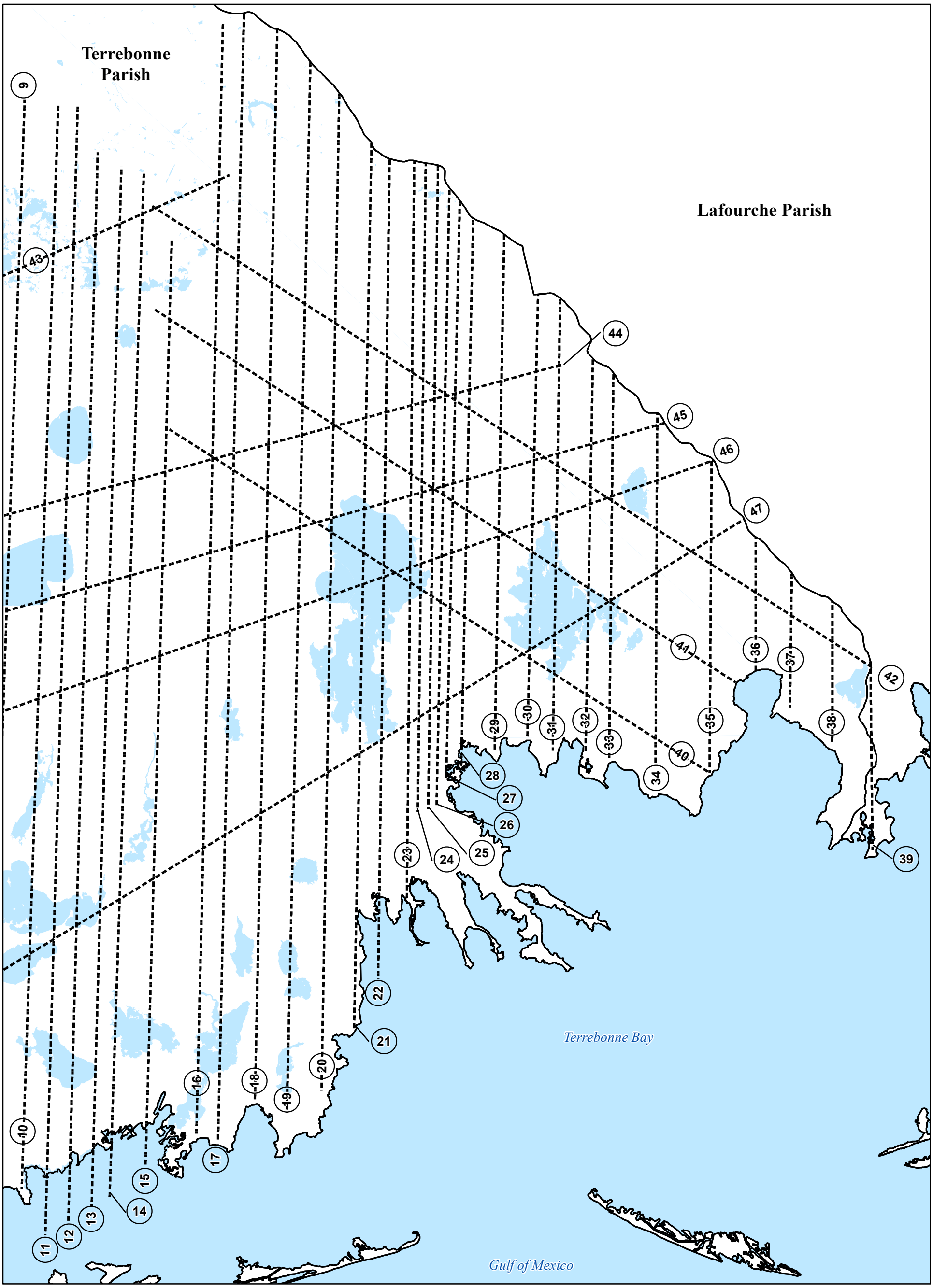
NATIONAL FLOOD INSURANCE PROGRAM

Transect Locator Map

0050E, 0075E, 0100E, 0150E, 0175E, 0200E, 0225E, 0250E, 0325E, 0350E, 0375E, 0400E, 0425E, 0525E, 0550E, 0575E, 0600E, 0625E, 0750E, 0775E, 0800E, 0825E, 0950E, 0975E

FEMA

Figure 9: Transect Location Map (continued)



1 inch = 16,667 feet 1:200,000

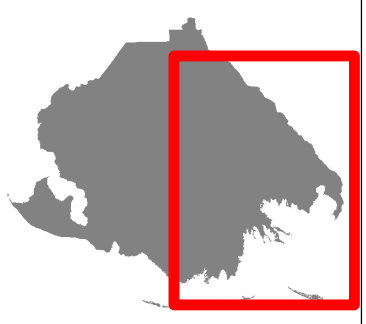
N

0 4,450 8,900 17,800 26,700 35,600 Feet

Map Projection:

Lambert Conformal Conic State Plane Louisiana Zone 1702; North American Datum 1983; Western Hemisphere; Vertical Datum: North American Vertical Datum of 1988

COUNTY LOCATOR



NATIONAL FLOOD INSURANCE PROGRAM

Transect Locator Map

0075E, 0100E, 0115E, 0125E, 0225E, 0235E, 0245E, 0250E, 0251E, 0252E, 0253E, 0254E, 0260E, 0275E, 0300E, 0400E, 0425E, 0450E 0475E, 0500E, 0600E, 0625E, 0650E, 0675E, 0700E, 0800E, 0825E, 0850E, 0950E, 0975E

FEMA

5.4 Alluvial Fan Analyses

This section is not applicable to this Flood Risk Project.

Table 17: Summary of Alluvial Fan Analyses

[Not Applicable to this Flood Risk Project]

Table 18: Results of Alluvial Fan Analyses

[Not Applicable to this Flood Risk Project]

SECTION 6.0 – MAPPING METHODS

6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov.

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks in the area, please visit the NGS website at www.ngs.noaa.gov.

The datum conversion locations and values that were calculated for Terrebonne Parish are provided in Table 19.

Table 19: Countywide Vertical Datum Conversion

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
Bayou Cocodrie	SW	29.500	-91.000	-0.364
Bayou Sauveur	SW	29.250	-90.875	-0.036
Carencro Bayou	SW	29.375	-91.125	-0.207
Cat Island Pass	SW	29.000	-90.625	0.052

Table 19: Countywide Vertical Datum Conversion (continued)

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
Central Isles Dernieres	SW	29.000	-90.875	0.020
Cocodrie	SW	29.125	-90.750	0.075
Dog Lake	SW	29.125	-90.875	0.023
Dulac	SW	29.375	-90.750	-0.118
East Bay Junop	SW	29.125	-91.125	-0.066
Eastern Isles Dernieres	SW	29.000	-90.750	0.046
Fourleague Bay	SW	29.250	-91.250	-0.125
Gibson	NE	29.750	-90.875	-0.272
Gibson	NW	29.750	-91.000	-0.259
Gibson	SE	29.625	-90.875	-0.594
Gibson	SW	29.625	-91.000	-0.344
Grand Bayou Du Large	SW	29.125	-91.000	-0.030
Houma	NE	29.625	-90.625	-0.020
Houma	NW	29.625	-90.750	-0.433
Houma	SE	29.500	-90.625	-0.039
Houma	SW	29.500	-90.750	-0.236
Humphreys	SW	29.500	-90.875	-0.394
Jacko Bay	SE	29.125	-90.375	0.062
Jacko Bay	SW	29.125	-90.500	0.075
Lake Felicity	NE	29.375	-90.375	-0.033
Lake Felicity	SE	29.250	-90.375	0.046
Lake Felicity	SW	29.250	-90.500	0.092
Lake La Graisse	SW	29.125	-90.625	0.098
Lake Mechant	SW	29.250	-91.000	-0.095
Lake Penchant	SW	29.375	-91.000	-0.213
Lake Quitman	SW	29.250	-90.750	0.089
Lake Tambour	SW	29.250	-90.625	0.193
Lake Theriot	SW	29.375	-90.875	-0.184
Lost Lake	SW	29.250	-91.125	-0.118
Montegut	NE	29.500	-90.500	-0.128
Montegut	SE	29.375	-90.500	-0.062
Montegut	SW	29.375	-90.625	-0.095
Morgan City SE	NW	29.625	-91.125	-0.344

Table 19: Countywide Vertical Datum Conversion (continued)

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
Morgan City SE	SW	29.5	-91.125	-0.305
Oyster Bayou	SW	29.125	-91.25	-0.082
Plumb Bayou	NW	29.5	-91.25	-0.259
Plumb Bayou	SW	29.375	-91.25	-0.187
Point Au Fer	SW	29.25	-91.375	-0.121
Timbalier Island	SE	29	-90.375	0.036
Timbalier Island	SW	29	-90.5	0.046
Western Isles Dernieres	SW	29	-91	-0.016
Average Conversion from NGVD29 to NAVD88 = -0.107 feet				

Table 20: Stream-Based Vertical Datum Conversion

[Not Applicable to this Flood Risk Project]

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM Database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA's *Guidelines and Standards for Flood Risk Analysis and Mapping*, www.fema.gov/flood-maps/guidance-partners/guidelines-standards.

Base map information shown on the FIRM was derived from the sources described in Table 21.

Table 21: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Digital Orthophoto	U.S. Department of Agriculture	2019	1:6,000	Digital orthoimagery
Political boundaries	Louisiana Department of Transportation and Development	2020	1:6,000	Municipal and county boundaries

Table 21: Base Map Sources (continued)

Data Type	Data Provider	Data Date	Data Scale	Data Description
Public Land Survey System (PLSS)	U.S. Bureau of Land Management	2020	1:6,000	PLSS Township
Transportation Features	Terrebonne Parish Communications District	2020	1:6,000	TPCG Streets
Surface Water Features	U.S. Geological Survey	2020	1:6,000	Streams, rivers, and lakes were derived from NHD data

6.3 Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 22. For each coastal flooding source studied as part of this FIS Report, the mapped floodplain boundaries on the FIRM have been delineated using the flood and wave elevations determined at each transect; between transects, boundaries were delineated using land use and land cover data, the topographic elevation data described in Table 22, and knowledge of coastal flood processes. In ponding areas, flood elevations were determined at each junction of the model; between junctions, boundaries were interpolated using the topographic elevation data described in Table 22.

In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 2 indicates the flooding sources for which floodways have been determined. The results of the floodway computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 23, “Floodway Data.”

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Terrebonne Parish, Consolidated Government	Bayou Grand Caillou; Ouiski Bayou; Gulf of Mexico	Light Detection and Ranging data (LiDAR)	7.0 cm RMSEz	+/- 3.8 ft at 95% confidence level	USGS 2011

*Data not available

BFEs shown at cross sections on the FIRM represent the 1-percent-annual-chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations.

Table 23: Floodway Data

[Not Applicable to this Flood Risk Project]

Table 24: Flood Hazard and Non-Encroachment Data for Selected Streams

[Not Applicable to this Flood Risk Project]

6.4 Coastal Flood Hazard Mapping

Flood insurance zones and BFEs including the wave effects were identified on each transect based on the results from the onshore wave hazard analyses. Between transects, elevations were interpolated using topographic maps, land-use and land-cover data, and knowledge of coastal flood processes to determine the aerial extent of flooding. Sources for topographic data are shown in Table 22.

Zone VE is subdivided into elevation zones and BFEs are provided on the FIRM.

The limit of Zone VE shown on the FIRM is defined as the farthest inland extent of any of these criteria (determined for the 1-percent-annual-chance flood condition):

- The *primary frontal dune zone* is defined in 44 CFR Section 59.1 of the NFIP regulations. The primary frontal dune represents a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes that occur immediately landward and adjacent to the beach. The primary frontal dune zone is subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune zone occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.
- The *wave runup zone* occurs where the (eroded) ground profile is 3.0 feet or more below the 2-percent wave runup elevation.
- The *wave overtopping splash zone* is the area landward of the crest of an overtopped barrier, in cases where the potential 2-percent wave runup exceeds the barrier crest elevation by 3.0 feet or more.

- The *wave overtopping splash zone* is the area landward of the crest of an overtopped barrier, in cases where the potential 2-percent wave runup exceeds the barrier crest elevation by 3.0 feet or more.
- The *breaking wave height zone* occurs where 3-foot or greater wave heights could occur (this is the area where the wave crest profile is 2.1 feet or more above the total stillwater elevation).
- The *high-velocity flow zone* is landward of the overtopping splash zone (or area on a sloping beach or other shore type), where the product of depth of flow times the flow velocity squared (hv^2) is greater than or equal to 200 ft^3/sec^2. This zone may only be used on the Pacific Coast.

The SFHA boundary indicates the limit of SFHAs shown on the FIRM as either "V" zones or "A" zones.

Table 25 indicates the coastal analyses used for floodplain mapping and the criteria used to determine the inland limit of the open-coast Zone VE and the SFHA boundary at each transect.

Table 25: Summary of Coastal Transect Mapping Considerations

Coastal Transect	Engineering Transect	Primary Frontal Dune (PFD) Identified	Wave Runup Analysis	Wave Height Analysis	Zone VE Limit	SFHA Boundary
			Zone Designation and BFE (ft NAVD88)	Zone Designation and BFE (ft NAVD88)		
1	1		N/A	VE 11-14 AE 10-12	Wave Height	SWEL
2	2		N/A	VE 9-15 AE 8-13	Wave Height	SWEL
3	3		N/A	VE 9-15 AE 8-13	Wave Height	SWEL
4	4		N/A	VE 10-15 AE 2-13	Wave Height	SWEL
5	5		N/A	VE 10-16 AE 2-13	Wave Height	SWEL
6	6		N/A	VE 10-16 AE 2-13	Wave Height	SWEL
7	6.5		N/A	VE 10-16 AE 2-13	Wave Height	N/A
8	7		N/A	VE 12-17 AE 3-13	Wave Height	N/A
9	7.5		N/A	VE 13-17 AE 3-14	Wave Height	N/A

Table 25: Summary of Coastal Transect Mapping Considerations (continued)

Coastal Transect	Engineering Transect	Primary Frontal Dune (PFD) Identified	Wave Runup Analysis	Wave Height Analysis	Zone VE Limit	SFHA Boundary
			Zone Designation and BFE (ft NAVD88)	Zone Designation and BFE (ft NAVD88)		
10	8		N/A	VE 13-17 AE 3-14	Wave Height	N/A
11	8.25		N/A	VE 14-17 AE 3-14	Wave Height	SWEL
12	8.5		N/A	VE 14-17 AE 3-14	Wave Height	SWEL
13	8.75		N/A	VE 13-17 AE 3-14	Wave Height	SWEL
14	9		N/A	VE 13-18 AE 3-14	Wave Height	SWEL
15	9.3		N/A	VE 13-18 AE 8-14	Wave Height	SWEL
16	9.6		N/A	VE 14-18 AE 3-14	Wave Height	SWEL
17	10		N/A	VE 14-18 AE 3-14	Wave Height	SWEL
18	10.25		N/A	VE 14-18 AE 3-14	Wave Height	SWEL
19	10.5		N/A	VE 14-18 AE 4-14	Wave Height	SWEL
20	10.75		N/A	VE 14-18 AE 5-14	Wave Height	SWEL
21	11		N/A	VE 14-18 AE 6-14	Wave Height	SWEL
22	11.5		N/A	VE 14-18 AE 7-14	Wave Height	SWEL
23	12		N/A	VE 14-18 AE 7-14	Wave Height	SWEL
24	12.25		N/A	VE 14-18 AE 6-14	Wave Height	SWEL
25	12.5		N/A	VE 14-18 AE 7-14	Wave Height	SWEL
26	12.75		N/A	VE 14-18 AE 7-14	Wave Height	SWEL
27	13		N/A	VE 14-18 AE 7-14	Wave Height	SWEL

Table 25: Summary of Coastal Transect Mapping Considerations (continued)

Coastal Transect	Engineering Transect	Primary Frontal Dune (PFD) Identified	Wave Runup Analysis	Wave Height Analysis	Zone VE Limit	SFHA Boundary
			Zone Designation and BFE (ft NAVD88)	Zone Designation and BFE (ft NAVD88)		
28	13.3		N/A	VE 14-18 AE 7-14	Wave Height	SWEL
29	13.6		N/A	VE 14-18 AE 6-14	Wave Height	SWEL
30	14		N/A	VE 14-18 AE 12-13	Wave Height	SWEL
31	14.3		N/A	VE 14-18 AE 12-15	Wave Height	SWEL
32	14.6		N/A	VE 14-18 AE 12-14	Wave Height	SWEL
33	15		N/A	VE 14-17 AE 12-14	Wave Height	SWEL
34	15.5		N/A	VE 14-17 AE 13-14	Wave Height	SWEL
35	16		N/A	VE 14-17 AE 13-14	Wave Height	SWEL
36	16.5		N/A	VE 14-17 AE 13	Wave Height	SWEL
37	17		N/A	VE 13-17 AE 13	Wave Height	SWEL
38	17.5		N/A	VE 13-16 AE 12-13	Wave Height	SWEL
39	18		N/A	VE 13 AE 12-13	Wave Height	SWEL
40	19		N/A	VE 13-17 AE 12-14	Wave Height	SWEL
41	20		N/A	VE 14-17 AE 10-14	Wave Height	SWEL
42	21		N/A	VE 13-17 AE 3-14	Wave Height	SWEL
43	TW2		N/A	VE 10-17 AE 3-15	Wave Height	SWEL
44	TW4		N/A	VE 10-17 AE 3-15	Wave Height	SWEL
45	TW6		N/A	VE 10-17 AE 3-15	Wave Height	SWEL

Table 25: Summary of Coastal Transect Mapping Considerations (continued)

Coastal Transect	Engineering Transect	Primary Frontal Dune (PFD) Identified	Wave Runup Analysis: Zone Designation and BFE (ft NAVD88)	Wave Height Analysis: Zone Designation and BFE (ft NAVD88)	Zone VE Limit	SFHA Boundary
46	TW7		N/A	VE 10-17 AE 3-15	Wave Height	SWEL
47	TW8		N/A	VE 10-17 AE 3-15	Wave Height	SWEL

A LiMWA boundary has also been added in coastal areas subject to wave action for use by local communities in safe rebuilding practices. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave.

6.5 FIRM Revisions

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table 30, "Map Repositories").

6.5.1 Letters of Map Amendment

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in a SFHA.

To obtain an application for a LOMA, visit www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms and download the form "MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill". Visit the "Flood Map-Related Fees" section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at www.fema.gov/flood-maps/tutorials.

For more information about how to apply for a LOMA, call the FEMA Mapping and Insurance eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

6.5.2 Letters of Map Revision Based on Fill

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA's determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms for the "MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill" or by calling the FEMA Mapping and Insurance eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the "Flood Map-Related Fees" section.

A tutorial for LOMR-F is available at www.fema.gov/flood-maps/tutorials.

6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms and download the form "MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision". Visit the "Flood Map-Related Fees" section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Mapping and Insurance eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Terrebonne Parish FIRM are listed in Table 26.

Table 26: Incorporated Letters of Map Change

[Not Applicable to this Flood Risk Project]

6.5.4 Physical Map Revisions

A Physical Map Revisions (PMR) is an official republication of a community's NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs.

The community's chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised

appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit www.fema.gov and visit the "Flood Map Revision Processes" section.

6.5.5 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit www.fema.gov to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

6.5.6 Community Map History

The current FIRM presents flooding information for the entire geographic area of Terrebonne Parish. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBMs) and/or Flood Boundary and Floodway Maps (FBFMs) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 27, "Community Map History." A description of each of the column headings and the source of the date is also listed below.

- *Community Name* includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.

- *Initial Identification Date (First NFIP Map Published)* is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or "pending" (for Preliminary FIS Reports) is shown. If the community is listed in Table 27 but not identified on the map, the community is treated as if it were unmapped.

- *Initial FHBM Effective Date* is the effective date of the first FHBM. This date may be the same date as the Initial NFIP Map Date.

- *FHBM Revision Date(s)* is the date(s) that the FHBM was revised, if applicable.

- *Initial FIRM Effective Date* is the date of the first effective FIRM for the community.

- *FIRM Revision Date(s)* is the date(s) the FIRM was revised, if applicable. This is

the revised date that is shown on the FIRM panel, if applicable. As countywide studies are completed or revised, each community listed should have its FIRM dates updated accordingly to reflect the date of the countywide study. Once the FIRMs exist in countywide format, as PMRs of FIRM panels within the county are completed, the FIRM Revision Dates in the table for each community affected by the PMR are updated with the date of the PMR, even if the PMR did not revise all the panels within that community.

The initial effective date for the Terrebonne Parish FIRMs in countywide format was September 7, 2023.

Table 27: Community Map History

Community Name	Initial Identification Date	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Houma, City of[1]	11/28/1973	11/28/1973	10/31/1978 04/09/1976	05/19/1981	N/A
Terrebonne Parish, Unincorporated Areas[2]	11/20/1970	N/A	N/A	11/20/1970	09/07/2023 04/02/1992 05/01/1985 12/16/1980 11/19/1976 07/01/1974 06/15/1973

[1] The City of Houma was consolidated into Terrebonne Parish following initial map releases

[2] Name prior to Terrebonne Parish, Consolidated Government

SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

7.1 Contracted Studies

Table 28 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

Table 28: Summary of Contracted Studies Included in this FIS Report

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Bayou Grand Caillou	09/07/2023	RAMPP	HSFEHQ-09-D-0369	September 2015	Terrebonne Parish, Consolidated Government
Gulf of Mexico	09/07/2023	RAMPP	HSFEHQ-09-D-0369	September 2015	Terrebonne Parish, Consolidated Government
Ouiski Bayou	06/1980	U.S. Army Corps of Engineers	IAA-H-7-76, Project Order No. 9	February 1979	Terrebonne Parish, Consolidated Government

Table 28: Summary of Contracted Studies Included in this FIS Report (continued)

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Zone A Wetlands	06/1980	U.S. Army Corps of Engineers	IAA-H-7-76, Project Order No. 9	February 1979	Terrebonne Parish, Consolidated Government

7.2 Community Meetings

The dates of the community meetings held for this Flood Risk Project and previous Flood Risk Projects are shown in Table 29. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

Table 29: Community Meetings

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
Terrebonne Parish, Consolidated Government	09/07/2023	9/28/2021	CCO Meeting	FEMA, the community, and the study contractor
		08/30/2016	FRR	FEMA, the community, and the study contractor
		09/10/2013	Kickoff	FEMA, the community, and the study contractor

SECTION 8.0 – ADDITIONAL INFORMATION

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see www.fema.gov.

Table 30 is a list of the locations where FIRMs for Terrebonne Parish can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 30: Map Repositories

Community	Address	City	State	Zip Code
Terrebonne Parish, Consolidated Government	Park Avenue Professional Building 7836 Park Avenue	Houma	LA	70360

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM Databases and LOMCs. Together they create a GIS data layer for a State or Territory. The NFHL is updated as studies become effective and extracts are made available to the public monthly. NFHL data can be viewed or ordered from the website shown in Table 31.

Table 31 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the State NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of State or territorial government to coordinate that State's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of State and local GIS data in their state.

Table 31: Additional Information

FEMA and the NFIP	
FEMA and FEMA Engineering Library website	www.fema.gov/flood-maps/products-tools/know-your-risk/engineers-surveyors-architects
NFIP website	www.fema.gov/flood-insurance
NFHL Dataset	msc.fema.gov
FEMA Region VI	FEMA Region VI 800 North Loop 288 Denton, TX 76209 (940) 383-7350
Other Federal Agencies	
USGS website	www.usgs.gov

Table 31: Additional Information (continued)

Hydraulic Engineering Center website	www.hec.usace.army.mil
State Agencies and Organizations	
State NFIP Coordinator	Cindy O'Neal Louisiana Department of Transportation & Development P.O. Box 94245, Capitol Station Baton Rouge, Louisiana 70804 (225) 274-4354 coneal@dotdmail.dotd.state.la.us
State GIS Coordinator	Craig Johnson, Director Louisiana Geographic Information Center E302 Howe-Russell Building Louisiana State University Baton Rouge, Louisiana 70803 Phone: (225) 578-3479 cjohnson@lsu.edu

SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

Table 32 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

Table 32: Bibliography and References

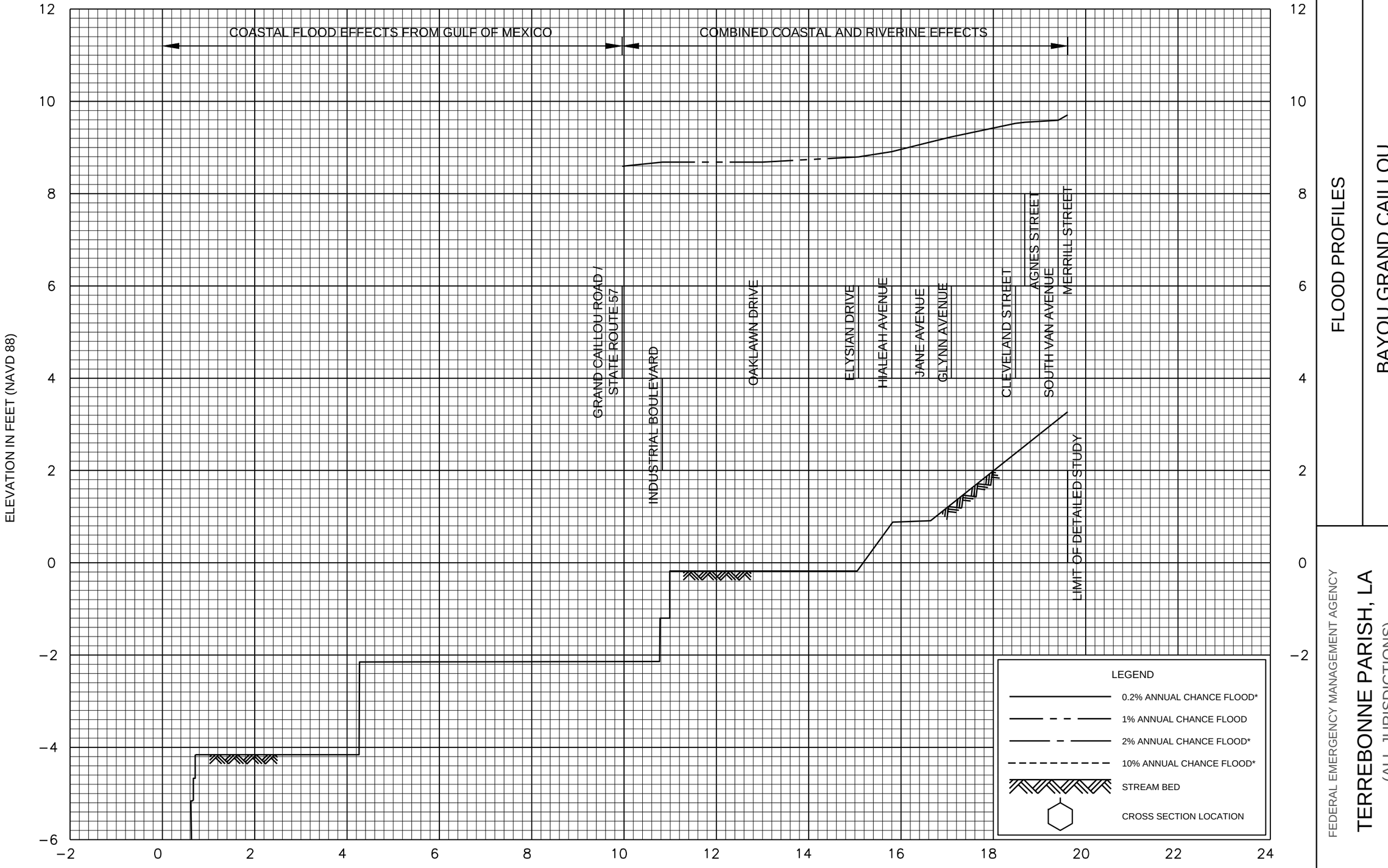
Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
BLM 2020	U.S. Bureau of Land Management	*PLSS Township*	U.S. Bureau of Land Management	Washington, D.C.	July 2, 2020	https://navigator.blm.gov/data?keyword=louisiana&fs_publicRegion=Eastern%20States
FEMA 2020	Federal Emergency Management Agency	*Levee Analysis and Mapping Procedure (LAMP), Terrebonne Parish, LA*	Federal Emergency Management Agency	Washington, D.C.	May 1, 2020	
FEMA 1980	Federal Emergency Management Agency	*Terrebonne Parish Unincorporated Areas Flood Insurance Study*	Federal Emergency Management Agency	Washington, D.C.	December 16, 1980	
LADOTD 2020	LA Department of Transportation and Development	*Census Incorporated Places 2019*	LA Department of Transportation and Development	Baton Rouge, LA	April 22, 2020	http://gismapping-ladotd.opendata.arcgis.com/datasets/census-incorporated-places-2019
Resio 2007		*White Paper on Estimating Hurricane Inundation Probabilities (with contributions from S.J. Boc, L. Borgman, V. Cardone, A. Cox, W.R. Dally, R.G. Dean, D. Divoky, E. Hirsh, J.L. Irish, d. Levinson, A. Niedoroda, M.D. Powell, J.J. Ratcliff, C. Stutts, J. Suhada, G.R. Toro, and P.J. Vickery). Appendix 8-2 (R2007) of USACE (2007), Interagency Performance Evaluation Taskforce (IPET) Final Report.*	Resio, D.T.		2007	

Table 32: Bibliography and References (continued)

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
Toro 2010		*"Efficient Joint Probability Methods for Hurricane Surge Frequency Analysis," Ocean Engineering, Vo. 37, pp. 125-134*	G. Toro, D.T. Resio, D. Divoky, A.W. Niedoroda, C.W. Reed		2010	
TPCD 2020	Terrebonne Parish Communications District	*TPCG Streets*	Terrebonne Parish Communications District	Houma, LA	April 20, 2020	
USACE 1961	U.S. Army Corps of Engineers, Hydrologic Engineering Center	*HEC-2, Water-Surface Profiles Computer Model*	U.S. Army Corps of Engineers		1961	
USACE 1966	U.S. Army Corps of Engineers, Hydrologic Engineering Center	*HEC-1, Flood Hydrograph Package Computer Model*	U.S. Army Corps of Engineers		1966	
USDA 2020	U.S. Department of Agriculture	*National Agriculture Imagery Program (NAIP)*	U.S. Department of Agriculture Farm Service Agency	Washington, D.C.	January 14, 2020	https://nrcs.app.box.com/v/naip/file/597516109411
USGS 2003	U.S. Department of Interior, Geological Survey	*Atlas: The Louisiana Statewide GIS*	U.S. Department of Interior, Geological Survey		2003	atlas.lsu.edu
USGS 2011	U.S. Department of Interior, Geological Survey	*Topographic LiDAR: Louisiana Region 1*	U.S. Department of Interior, Geological Survey	Charleston, SC	2011	https://www.fisheries.noaa.gov/inport/item/50119

Table 32: Bibliography and References (continued)

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USGS 2020	U.S. Geological Survey	*National Hydrography Dataset (NHD)*	U.S. Geological Survey	Washington, D.C.	September 1, 2020	



*DATA NOT AVAILABLE

FLOOD PROFILES

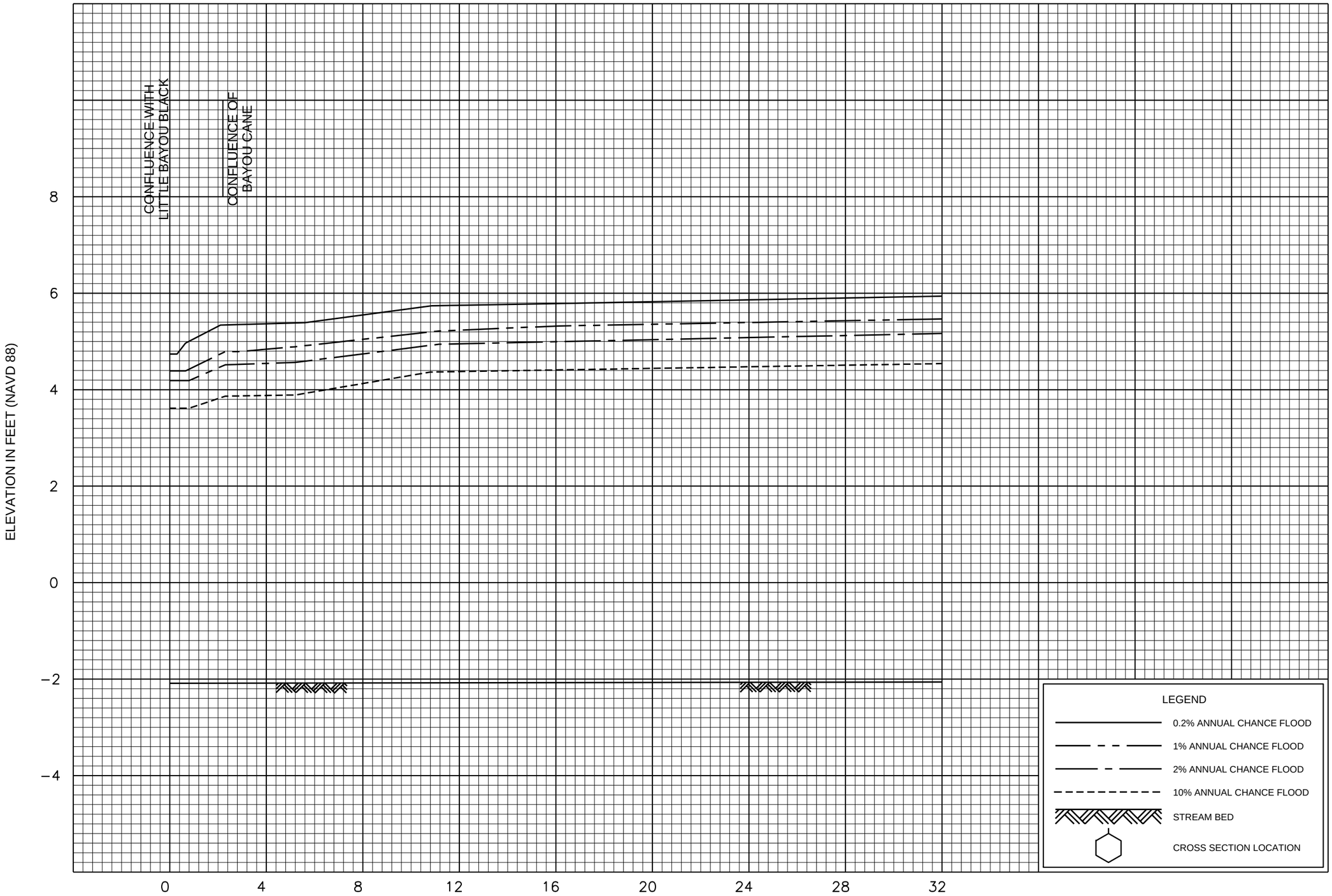
BAYOU GRAND CAILLOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TERREBONNE PARISH, LA

(ALL JURISDICTIONS)

01P



FLOOD PROFILES

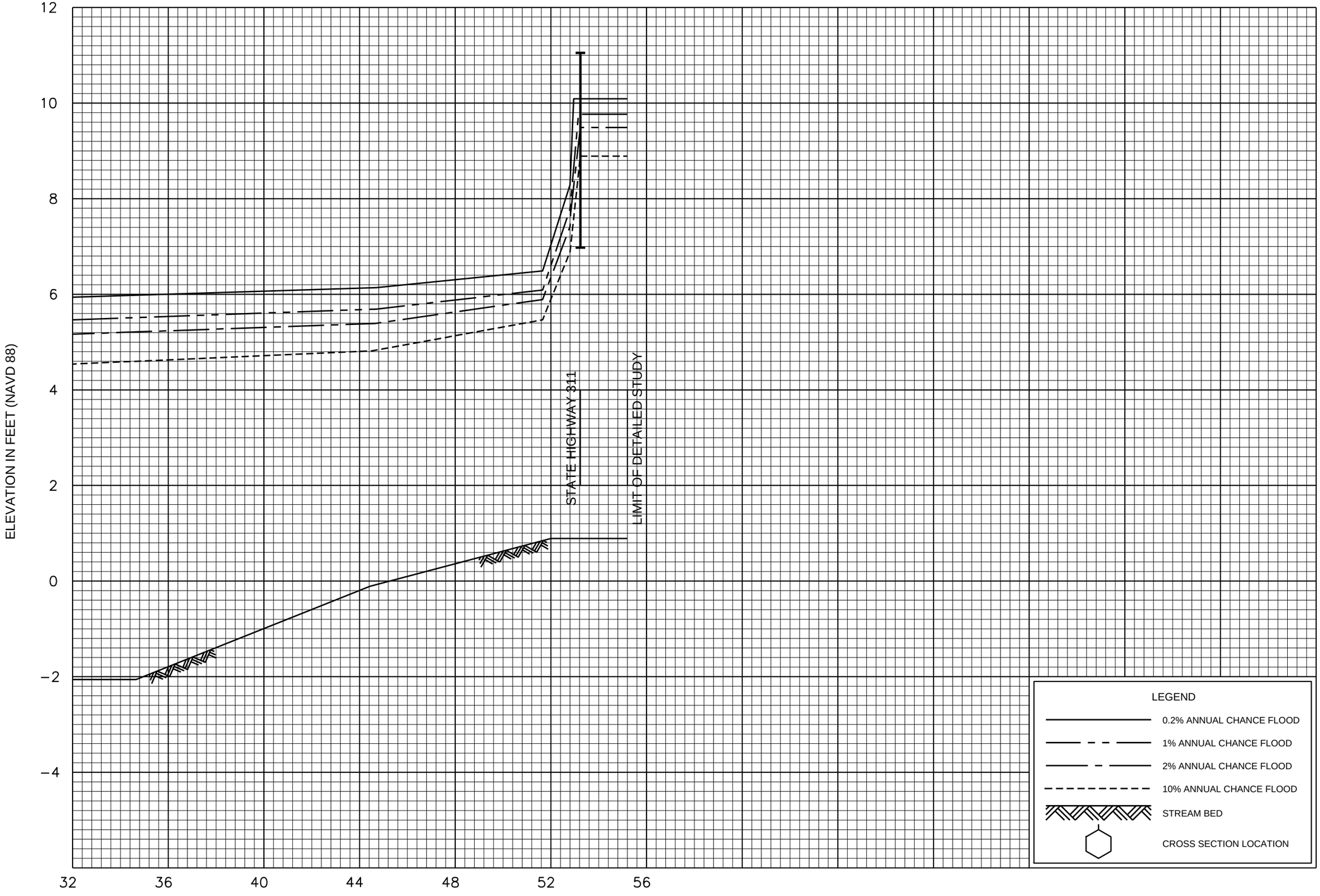
OUISKI BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TERREBONNE PARISH, LA

(ALL JURISDICTIONS)

02P



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