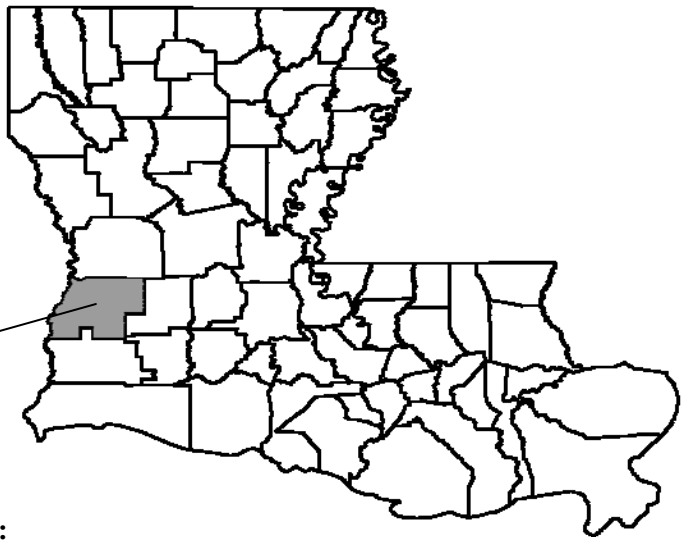
FLOOD INSURANCE STUDY

BEAUREGARD PARISH, LOUISIANA

AND INCORPORATED AREAS

Community Name	Community Number
BEAUREGARD PARISH (UNINCORPORATED AREAS)	220026
DERIDDER, CITY OF	220027
MERRYVILLE, TOWN OF	220028



This Preliminary FIS report only includes revised Floodway Data and Flood Profiles. The unrevised Floodway Data and Flood Profiles will appear in the final FIS report.

REVISED:

PRELIMINARY
JANUARY 29, 2016

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
22011CV000B

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Parishwide FIS Effective Date: November 26, 2010

Revised Parishwide FIS Date: [TBD]

This Preliminary FIS report only includes revised Floodway Data and Flood Profiles. The unrevised Floodway Data and Flood Profiles will appear in the final FIS report.

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FLOOD INSURANCE STUDY
BEAUREGARD PARISH, LOUISIANA, AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Beauregard Parish, including the City of DeRidder; the Town of Merryville; and the unincorporated areas of Beauregard Parish (referred to collectively herein as Beauregard Parish), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

Please note that the City of DeRidder is geographically located in Beauregard and Vernon Parishes. Only a small portion of the City of DeRidder extends into Vernon Parish and does not contain flood hazard information, therefore, the City of DeRidder is shown in its entirety in this FIS report.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence, and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

Flood hazard information for the Town of Merryville was previously shown on Flood Hazard Boundary Maps (FHBMs); therefore, information on the authority and acknowledgments for this study is not available.

The hydrologic and hydraulic analyses for the City of DeRidder were prepared by the United States Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-87-E-2548, Project Order No. 3 and EMW-88-E-2764, Project Order No. 4 (FEMA, 1992). This work was completed in September 1990.

The hydrologic and hydraulic analyses for the unincorporated areas of Beauregard Parish were prepared by the USGS for FEMA, under Inter-Agency Agreement No. EMW-87-E-2512, Project Order No. 2 (FEMA, 1990). This work was completed in February 1988.

For the November 26, 2010, initial parishwide FIS, no new hydrologic and hydraulic analyses were performed by FTN/Taylor Joint Venture, for FEMA under Contract No.

EMT-2002-CO-0050, Homeland Security Task Order No. 037. This study was completed in March 2009.

For the November 26, 2010, initial parishwide FIS, base map information shown on the FIRM was provided in digital format from the State of Louisiana GIS Atlas, 2008.

For the [TBD], FIS revision, hydrologic and hydraulic analyses for the Sabine River were taken from the FIS from Newton County, Texas and Incorporated Areas (FEMA, 1998). Streams previously studied by approximate analyses were restudied using approximate methods if they were located in the Light Detection and Ranging (LiDAR) data extent within the scope of this revision. This work was performed by Risk Assessment, Mapping, and Planning Partners (RAMPP), for FEMA under Contract No. HSFHQ-09-D-0369, Homeland Security Task Order No. HSFE06-11-J-0001. This study was completed in November 2015.

For the [TBD], FIS revision, base map information shown on the FIRM was derived from U.S. Census Bureau TIGER files dated 2015; and from the State of Louisiana GIS Atlas data dated 2008.

The coordinate system used for the production of this FIRM is State Plane Louisiana (FIPS ZONE 1702), North American Datum of 1983 (NAD 83). Corner coordinates show on the FIRM are in latitude and longitude referenced to State Plane Louisiana (FIPS ZONE 1702) projection, NAD 83. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of the information shown on the FIRM.

1.3 Coordination

The dates of the initial and final Consultation Coordination Officer (CCO) meetings held for Beauregard Parish and the incorporated communities are shown in the following tabulation.

Community Name	Initial CCO Date	Final CCO Date
DeRidder, City of	*	June 25, 1991
Merryville, Town of	*	*
Beauregard Parish (Unincorporated Areas)	September 3, 1986	January 31, 1989

* Data not available

For the November 26, 2010, parishwide FIS, the initial CCO Meeting was held on June 27, 2007, with representatives of FEMA, the communities, and the study contractors.

The results of the November 26, 2010, parishwide FIS were reviewed at the final CCO Meeting held on June 24, 2009, and attended by representatives of FEMA, the communities, and the study contractor. All problems raised at that meeting have been addressed in this study.

For the [TBD], FIS revision, the initial CCO Meeting (study kick-off meeting) was held on April 23, 2013, and attended by representatives from the Natural Resources Conservation Service (NRCS), the Louisiana State NFIP Coordinator, the Sabine River Authority Louisiana (SRALA), FEMA, and the study contractor RAMPP. Additionally a Flood Risk Review meeting was held on June 15, 2015, and attended by representatives from Beauregard Parish, Sabine River Authority, the Louisiana State NFIP Coordinator, FEMA and the study contractor RAMPP.

The results of the [TBD], FIS revision, were reviewed at the final CCO Meeting held [TBD], and attended by representatives of [attendee list].

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the geographic area of Beauregard Parish, Louisiana, including the incorporated communities listed in Section 1.1, and includes a portion of the Lower Sabine Watershed (Hydrologic Unit Code [HUC] 8 – 12010005).

The Lower Sabine Watershed encompasses drains an area of approximately 9,700 square miles and extends across eight counties and parishes along the state boundary between Louisiana and Texas. The primary river in the watershed is the Sabine River, which originates in north-central Texas. The Sabine River forms the boundary between Louisiana and Texas in its lower course, and forms the Sabine Lake, a saltwater estuary that is part of the Gulf of Mexico, at the southern extent. Toledo Bend Dam is located at the upstream end of the Watershed; within the Watershed the Sabine River is partially controlled by Toledo Bend Reservoir which is jointly operated by SRAs of Texas and Louisiana. The primary purpose of this reservoir is to provide a water supply to communities in the Watershed; important secondary purposes are to provide hydroelectric power generation and recreation. In Beauregard Parish major drainages in the watershed include Bayou Anacoco and Old River.

The November 26, 2010, study combined the individual community studies into a parishwide FIS and converted all FIRMs to Digital FIRM (DFIRM) format.

All stream reaches with detailed mapping not studied for the November 26, 2010, parishwide study were redelineated. All stream reaches with approximate mapping not studied for the November 26, 2010, parishwide study were remapped to the best available topographic data. The November 26, 2010, parishwide study also incorporated Letters of Map Change (LOMC) issued by FEMA since the prior effective FIRMs. Additionally, corporate limits information was updated in the November 26, 2010, parishwide study to reflect annexations and/or de-annexations of land by the incorporated communities within Beauregard Parish.

The [TBD], FIS revision incorporated the detailed hydrologic and hydraulic analyses for the Sabine River from the Newton County, Texas and Incorporated Areas FIS (FEMA, 1998). Additionally, Streams previously studied by approximate analyses were restudied using approximately methods if they were located in the LiDAR data extent within the scope of this revision.

2.2 Community Description

Beauregard Parish has two incorporated communities (Encyclopedia Louisiana, 1998). The City of DeRidder and the Town of Merryville, situated in the north and west part of the parish respectively.

Beauregard Parish is located in southwest Louisiana (FEMA, 1990). It is bordered by Newton County, Texas to the west; Calcasieu Parish to the south; Jefferson Davis Parish to the southeast; Vernon Parish to the north; and Allen Parish to the east. The City of DeRidder is the parish seat (Wikipedia, 2000).

Beauregard Parish encompasses a land area of approximately 1,160 square miles (U.S. Census Bureau, 2001).

The 2014 populate estimate for Beauregard Parish is 36,198, a slight increase in total population from the 2010 U.S. Census where Beauregard Parish had a total population estimated at 35,654 (U.S. Census Bureau, 2015[a]). The City of DeRidder is the largest community in the Parish with an estimated 2014 population of 10,799. This is an increase since the 2010 U.S. Census where the City of DeRidder had a population of 10,578 (U.S. Census Bureau, 2015[b]). Major transportation arteries in the parish include the Kansas City Southern and Union Pacific Railroads; U.S. Highway 171 and 190; State Highways 12, 26, and 27; and numerous parish roads (Wikipedia, 2000).

For Beauregard Parish, the average low temperature is 50.7 degrees Fahrenheit (°F) in winter to the average high of 81.7 °F during the summer months (National Oceanic and Atmospheric Administration [NOAA], Date Unavailable). The average precipitation is 61.4 inches annually. The month of December generally receives the most precipitation with about 6.7 inches, while April receives the least with about 4.1 inches (NOAA, Date Unavailable).

2.3 Principal Flood Problems

Hurricanes and tropical storms produce heavy rains and cause frequent flooding in Beauregard Parish.

In 2005, Hurricanes and Katrina and Rita struck Beauregard Parish. Both reached Category 5 intensity, the first time in recorded history that two hurricanes had done so in the Gulf of Mexico. Hurricane Katrina made landfall in Louisiana on August 20, 2005. The storm surge was so strong that it destroyed buildings and most tidal gages failed. Katrina was one of the deadliest and costliest natural disasters to ever occur in the United States. Hurricane Rita developed in September, causing additional damage to the Louisiana and Texas coasts.

In 2008, Hurricanes Gustav and Ike impacted the area within two weeks of each other. Before reaching the area, Hurricane Gustav devastated Haiti, the Dominican Republic, Jamaica, Cuba, and the Cayman Islands before hitting Louisiana, where it weakened into a tropical storm and then moved onward over the rest of the southern United States. Hurricane Ike followed and caused devastation all across the Louisiana and Texas coastlines.

In October and November of 2009, record rainfall amounts fell throughout the region. The USGS gage at Bon Weir, TX reported 66,800 cubic feet per second (cfs) with a crest

of 36.1 feet on the Sabine River. A presidential disaster declaration was declared on December 10, 2010. The same storm systems also spawned multiple tornadoes which caused tremendous damage.

In the City of DeRidder, principal flood problems were identified through contact with FEMA Region VI officials (FEMA, 1992). The flooding areas identified were Hickory Branch from about 1,800 feet upstream from Flat Creek to about 1,600 feet upstream from Park Road, and parts of Palmetto Creek that run through the city limits. The extent of flooding on Palmetto Creek was defined using data from the Beauregard Parish, Louisiana, Unincorporated Areas FIS. No recorded stream flow data are available for either Hickory Branch or Palmetto Creek (FEMA, 1990).

In Beauregard Parish, major floods cause localized inundation of structures along Cowpen Creek and Palmetto Creek (FEMA, 1990).

Low-lying areas adjacent to the Sabine River are subject to periodic flooding. Official records of past floods show that damaging floods occurred during 1884, 1913, 1945, 1953, 1989, and 1991. The discharges and recurrence intervals of three flood events on the Sabine River are presented below (FEMA, 1998).

	May 1989		July 1989		April 1991	
Gage Name	Discharge (cfs*)	Recurrence Interval (years)	Discharge (cfs*)	Recurrence Interval (years)	Discharge (cfs*)	Recurrence Interval (years)
State Highway 12 (Ruliff)	89,800	40	109,000	85	58,800	8
U.S. Highway 190 (Bon Weir)	91,200	47	98,200	75	72,100	19
State Highway 63 (Burkeville)	116,000	180	103,000	97	79,800	37

*cfs = cubic feet per second

2.4 Flood Protection Measures

In the City of DeRidder, other than local stream channel improvements, there are no flood protection measures (FEMA, 1992).

There are no flood protection measures in the unincorporated areas of Beauregard Parish (FEMA, 1990).

The Toledo Bend Reservoir, a water-supply reservoir, was constructed on the Sabine River just north of the study area in 1967 (FEMA, 1998). The SRA determined that this reservoir provides some degree of regulation on lower flows, but does not specifically impact the 1-percent annual chance flood and larger events (SRA, 1993).

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods 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 once on the average during any 10-, 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-, 50-, 100-, and 500-year floods, have a 10-, 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 1-percent-annual-chance (100-year) flood in any 50-year period is approximately 40 percent (4 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.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

3.1.1 Detailed Study Streams

For the [TBD], parishwide FIS revision, detailed hydrologic analysis for the Sabine River was taken from the Newton County, Texas and Incorporated Areas FIS (FEMA, 1998). A log-Pearson Type III statistical analysis of peak-discharge records at three USGS gaging stations on the lower Sabine River below the Toledo Bend Dam was performed. Each of these gaging stations is located within a detailed study reach. The locations and lengths of flow records used in the 1998 Newton County, Texas FIS are: Gage No. 08026000 at State Highway 63 – 35 years; Gage No. 08028500 at U.S. Highway 190 – 67 years; and Gage No. 08030500 at State Highway 12 – 79 years.

The data record for the two gaging stations with shorter records was extended by a regression- analysis technique. In order to reflect the effect of reservoir regulation on downstream river flows, systematic record non-regulated discharges prior to 1967 were converted to “regulated” flows prior to performing the statistical analysis. The log-Pearson Type III statistical analysis of the records from the State Highway 63 and U.S. Highway 190 gage records was adopted for use in the hydraulic studies. However, the peak discharges for the Deweyville area from the State Highway 12 gaging station conflicted with two previous studies: the 1988 FIS of Calcasieu Parish, Louisiana, Unincorporated Areas, adjacent to the Deweyville study area, and the 1982 FIS of Orange County, Texas, Unincorporated Areas just downstream from Deweyville.

Discharges for the State Highway 12 gaging station for the Newton County, Texas 1998 FIS are statistically similar to discharges in the Calcasieu Parish, Louisiana FIS, but statistically dissimilar to flows calculated within the Orange

County, Texas FIS. Therefore, in accordance with FEMA Guidelines, the Calcasieu Parish, Louisiana FIS discharges were used for the Deweyville area study.

Although peak discharges for the upstream detailed study reach adjacent to the Toledo Bend Dam were in general based on the analysis of the State Highway 63 gage, discharges for the reach upstream of the Power Plant Discharge Channel were adjusted to reflect SRA operating policies. Records maintained by SRA indicate that when total peak flow released from the Toledo Bend Dam exceeds approximately 50,000 cfs, the maximum release rate from the hydropower station is maintained at 18,000 cfs, and the remaining peak flow is released from the spillwater tainter gates. Therefore, 18,000 cfs were subtracted from each peak-flood discharge for this upstream reach.

3.1.2 Redelineated Detailed Study Streams

No new detailed hydrologic analysis was performed for the initial parishwide study.

In the FIS for the City of DeRidder, dated October 16, 1992, and in the FIS for the unincorporated areas of Beauregard Parish, dated May 3, 1990, hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community (FEMA, 1992 and 1990).

No stream flow data were available for either Hickory Branch or Palmetto Creek. The flood-frequency discharge values for these streams were determined by methods outlined by F.N. Lee (Louisiana Department of Transportation and Development [LaDOTD], 1985). The equations given in that report were developed for the purpose of estimating the 20-, 10-, 2-, and 1-percent-annual-chance flood for natural, unaltered streams in Louisiana. The discharges used in this study were adjusted for urban conditions (USGS, 1983). Discharge values were decreased in the upstream direction based on a technical report entitled, Magnitude and Frequency of Floods in Louisiana (LaDOTD, 1985). The discharge values computed for the 20-, 10-, and 2-percent-annual-chance flood events were not available for publication in this report.

Peak discharge-drainage area relationships for the flooding sources studied by detailed methods are shown in Table 1, “Summary of Discharges.”

Table 1 - Summary of Discharges

FLOODING SOURCE AND LOCATION:	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Cowpen Creek					
Approximately 125 downstream of Graybow Road	5.7	--[1]	--[1]	4,120	--[1]
Approximately 75 downstream of Weldon Road	3.4	--[1]	--[1]	3,070	--[1]
Approximately 0.5 mile upstream of Weldon Road	1.4	--[1]	--[1]	1,520	--[1]
Hickory Branch					
Approximately 0.25 mile upstream of confluence with Flat Creek	6.5	--[1]	--[1]	4,820	--[1]
Approximately 0.5 mile upstream of confluence with Flat Creek	5.7	--[1]	--[1]	4,200	--[1]
Approximately 0.8 mile upstream of confluence with Flat Creek	4.5	--[1]	--[1]	3,490	--[1]
Approximately 150 feet upstream of Kansas City southern Railroad	3.5	--[1]	--[1]	2,990	--[1]
Approximately 80 feet downstream of Park Road	2.6	--[1]	--[1]	2,360	--[1]
Palmetto Creek					
At U.S. Highway 190	17.5	--[1]	--[1]	9,950	--[1]
At confluence of Church Branch	17.0	--[1]	--[1]	9,720	--[1]
At confluence of Beetree Branch	13.2	--[1]	--[1]	8,960	--[1]
Approximately 75 feet downstream of Morris Road	10.2	--[1]	--[1]	7,310	--[1]
At Kansas City Southern Railroad	7.3	--[1]	--[1]	5,610	--[1]
Approximately 100 feet downstream of State Highway 27	6.2	--[1]	--[1]	4,930	--[1]
Upstream of Graybow Road	5.1	--[1]	--[1]	4,230	--[1]
Approximately 100 feet downstream of U.S. Route 190	1.1	--[1]	--[1]	1,260	--[1]
Sabine River					
At State Highway 12	9,329	66,100	98,700	113,800	150,000
At U.S. Highway 190	8,229	61,000	94,000	110,000	148,000
At State Highway 63	7,482	57,000	90,000	105,000	144,000
At the Toledo Bend Dam[2]	7,178	39,000	72,000	87,000	126,000

[1] Data Not Available
[2] Adjusted for discharges from hydropower tailrace

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods for selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. 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.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the FIRM (Exhibit 2).

The hydraulic analyses for this study and the previous studies were based on unobstructed flow. The flood elevations shown on the profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.2.1 Detailed Study Streams

For the [TBD], parishwide FIS revision, detailed hydraulic analysis for the Sabine River was taken from the Newton County, Texas and Incorporated Areas FIS (FEMA, 1998).

Water-surface elevations of the 10-, 2-, 1-, and 0.2-percent annual chance floods were computed using the U.S. Army Corps of Engineers (USACE's) Hydrologic Engineering Center (HEC) HEC-2 computer program (USACE, 1991).

Channel and valley cross sections were obtained by field surveys and available data from the Texas Department of Transportation; the USACE; the Atchison, Topeka, and Santa Fe Railroad; and the Kansas City Southern Railroad (Kansas City Southern Railroad Company, 1991; Atchison, Topeka and Santa Fe Railroad, 1922; Texas Department of Transportation, 1993).

Roughness factors (Manning's "n") were assigned to elements of the valley on the basis of field inspection, aerial photos, and calibration to the rating from the USGS curves of the three stream gages in the study area from a previous study (Kansas City Southern Railroad Company, 1991; Atchison, Topeka and Santa Fe Railroad, 1922; Texas Department of Transportation, 1993). The channel and overbank Manning's "n" values for the study streams are shown in Table 2, "Summary of Roughness Coefficients".

Starting water-surface elevations for the Sabine River were obtained from the hydraulic analyses in the SRA study (SRA, 1993).

3.2.2 Redelineated Detailed Study Streams

In the FIS for the City of DeRidder, dated October 16, 1992, and in the FIS for the unincorporated areas of Beauregard Parish, dated May 3, 1990, cross sections used in the backwater analysis were obtained by transit stadia or synthesized based on the preceding natural valley cross section and adjusted for channel slope and width where necessary (FEMA, 1992 and 1990). Bridge geometry and road grade elevations were obtained to determine their effect on the flood profile (FEMA, 1992). The survey for Hickory Branch was conducted between February 26 and March 1, 1990. For this stream, 3 natural valley cross sections were obtained and 26 cross sections were synthesized. The survey for Palmetto Creek was conducted between September 25 and November 20, 1986, for a FIS for Beauregard Parish. Although some of the cross sections used in that study are outside the city limits of DeRidder as now defined, they were used in defining that part of the flood profile of Palmetto Creek that runs through DeRidder. For Palmetto Creek, 18 natural valley cross sections were obtained and 20 cross sections were synthesized.

Water-surface elevations of floods of the selected recurrence intervals were computed using the USGS Water-Surface PROfile Computations (WSPRO) step-backwater computer program (USGS, 1986). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. Starting water-surface elevations for the streams studied were computed based on slope conveyance computations.

Roughness factors (Manning's “n”) used for the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and floodplain areas.

The channel and overbank Manning’s “n” values for the study streams are shown in Table 2, “Summary of Roughness Coefficients”.

Table 2 - Summary of Roughness Coefficients

	Manning’s “n” values	
Stream Name	**Channel**	**Overbanks**
Cowpen Creek	0.06 - 0.14	0.06 - 0.14
Hickory Branch	0.04	0.18
Palmetto Creek	0.07 - 0.16	0.07 - 0.16
Sabine River	0.025-0.035	0.050-0.140

3.3 Vertical Datum

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 NAVD as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. Some of the data used in this revision were taken from the prior effective FIS reports and FIRMs and adjusted to NAVD88. The datum conversion factor from NGVD29 to NAVD88 in Beauregard Parish is determined on a stream-by-stream basis since the maximum offset from the established average conversion factor is greater than 0.25 foot.

Table 3 - Summary of Multiple Datum Conversion Factors

Stream Name	**Minimum Conversion**	**Maximum Conversion**	**Average Conversion**	**Maximum Offset**
Cowpen Creek	-0.51	-0.54	-0.53	0.02
Hickory Branch	-0.49	-0.53	-0.51	0.02
Palmetto Creek	-0.46	-0.55	-0.51	0.05

For the Sabine River and streams redelineated utilizing more up-to-date topographic information, a datum conversion factor of -0.27 was applied to adjust from NGVD29 to NAVD88. The datum conversion factor was taken from the March 3, 2011, FIS for Vernon Parish, Louisiana and Incorporated Areas (FEMA, 2011).

For additional information regarding conversion between the NGVD and NAVD, visit the National Geodetic Survey (NGS) website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC–3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282
(301) 713-3242

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 Technical Support

Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent annual chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2- percent annual chance flood elevations; delineations of the 1- and 0.2-percent annual chance floodplains; and a 1-percent annual chance floodway. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should review the data presented in the FIS report as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

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

For the November 26, 2010, parishwide FIS, the 0.2-percent annual chance event was determined. For each stream studied by detailed methods, the 1-percent annual chance floodplain boundaries were delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic data at a scale of 1:12,000, with a contour interval of 2 feet (Cunningham, *et. al.*, 2006).

For the November 26, 2010, parishwide FIS, approximate 1-percent annual chance floodplain boundaries were remapped based on approximate modeling. These floodplain boundaries were adjusted using topographic data at a scale of 1:12,000, with a contour interval of 2 feet (Cunningham, *et. al.*, 2006).

For the [TBD], FIS revision, floodplain boundaries for the Sabine River and approximate studies redelineated were interpolated using LiDAR data collected by M.J. Harden Associates, Inc. (a Digital Globe company) from January 3, 2011, to February 13, 2011.

The 1-percent annual chance floodplain boundaries are shown on the FIRM. On this map, the 1-percent annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). 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.

For the streams studied by approximate methods, only the 1-percent annual chance floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. Floodways are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this FIS 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. The results of the floodway computations are tabulated for selected cross sections (Table 4). The computed floodways are shown on the revised FIRM (Exhibit 2). In cases where the floodway and 1-percent annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 4, “Floodway Data.” To reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

No floodways were computed for Cowpen Creek, Hickory Branch, and Palmetto Creek (FEMA, 1992 and 1990). The floodway for the Sabine River was taken from the Newton County, Texas and Incorporated Areas FIS (FEMA, 1998).

The area between the floodway and 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent annual chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

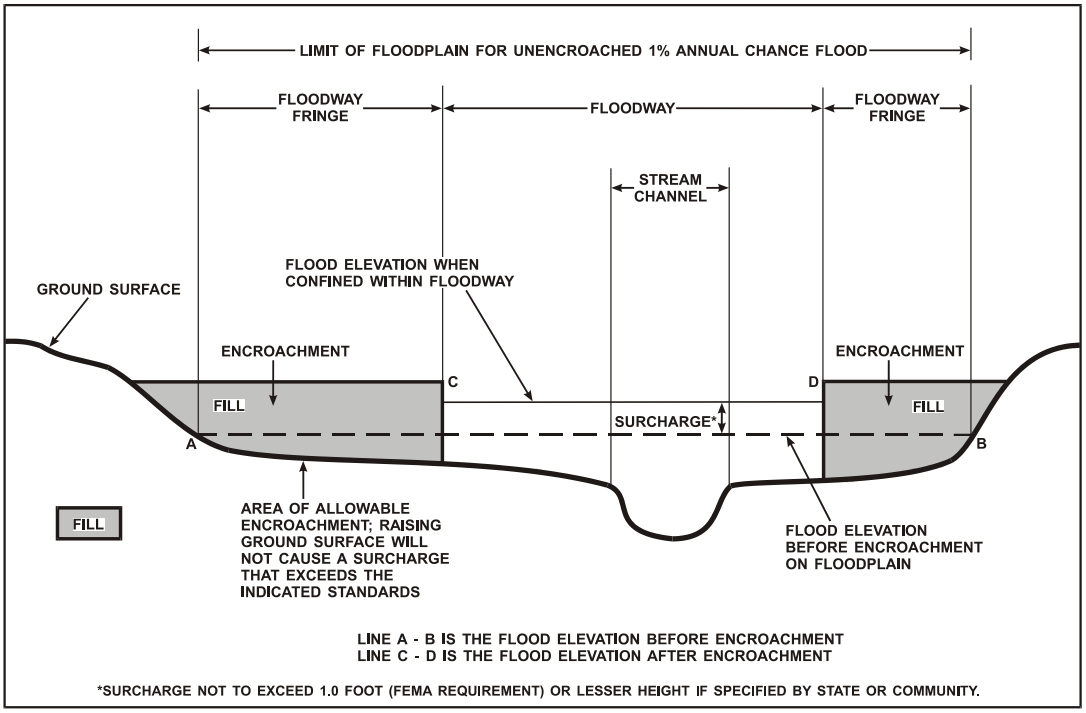


Figure 1 - Floodway Schematic

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Sabine River								
A	306,438	12,635/1,165	120,096	0.9	36.7	36.7	37.4	0.7
B	339,488	8,388/5,910	101,090	1.1	42.5	42.5	43.3	0.8
C	377,438	12,699/10,390	126,882	0.9	46.2	46.2	47.1	0.9
D	406,238	8,952/2,890	77,974	1.5	51.9	51.9	52.6	0.7
E	428,238	11,285/385	95,337	1.2	55.9	55.9	56.8	0.9
F	459,738	16,794/16,485	151,302	0.8	60.2	60.2	61.0	0.8
G	478,238	13,650/11,935	116,361	1.0	63.1	63.1	63.7	0.6
H	497,038	16,660/14,320	92,950	1.2	66.2	66.2	67.0	0.8
I	512,748	16,200/12,390	28,321	3.9	71.6	71.6	72.1	0.5
J	521,248	15,076/10,360	106,989	1.0	73.0	73.0	73.7	0.7
K	534,898	8,673/4,590	33,714	3.3	74.3	74.3	75.1	0.8
L	559,088	10,875/3,275	122,241	0.9	79.9	79.9	80.9	1.0

[1] Feet above mouth
[2] Total Width/Width within parish boundary

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

BEAUREGARD PARISH, LA

AND INCORPORATED AREAS

FLOODWAY DATA

SABINE RIVER

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent annual chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent annual chance floodplain, areas within the 0.2-percent annual chance floodplain, areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile (sq. mi.), and areas protected from the base flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP (FIRM)

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent annual chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1-and 0.2-percent annual chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The parishwide FIRM presents flooding information for the entire geographic area of Beauregard Parish. Historical data relating to the pre-parishwide maps prepared for each community are presented in Table 5, “Community Map History”.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Beauregard Parish (Unincorporated Areas)	January 17, 1975	August 23, 1977	May 3, 1990	
DeRidder, City of	February 1, 1974	July 16, 1976 March 27, 1979	October 19, 1982	October 16, 1992
Merryville, Town of	May 24 ,1974	December 26, 1975	February 1, 1987	

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

BEAUREGARD PARISH, LA AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

This report either supersedes or is compatible with all previous studies published for streams studied in this report and should be considered authoritative for the purposes of the NFIP. This includes the FIS information for the City of DeRidder, Town of Merryville, Beauregard Parish Unincorporated Areas and Beauregard Parish and Incorporated Areas (FEMA, 1992, 1990, and 2010).

The [TBD], FIS revision, is part of the larger Lower Sabine Watershed HUC-8 (12010002) study covering flooding sources in Calcasieu, Cameron, Sabine, and Vernon Parishes, Louisiana; and Jasper, Newton, and Orange Counties, Texas. Additional materials related to the entire Lower Sabine Watershed study may be obtained by accessing the Technical Support Data Notebook. Interested individuals may contact FEMA to access these data.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA Region VI, Federal Insurance and Mitigation Division, 800 North Loop 288, Denton, Texas 76209.

9.0 BIBLIOGRAPHY AND REFERENCES

Atchison, Topeka and Santa Fe Railroad, Bridge over Sabine River, August, 1922.

Cunningham, Robert, Gisclair, David, and Craig, John, The Louisiana Statewide LIDAR Project, Louisiana State University, Baton Rouge, LA, 2006.

Encyclopedia Louisiana. http://enlou.com/parishes/beauregard-parish.htm, Copyright 1998, updated September 20, 2000.

Federal Emergency Management Agency, Flood Insurance Study, Vernon Parish, Louisiana, and Incorporated Areas, Washington, D.C. March 3, 2011.

Federal Emergency Management Agency, Flood Insurance Study, Beauregard Parish, Louisiana, and Incorporated Areas, Washington, D.C. November 26, 2010.

Federal Emergency Management Agency, Flood Insurance Study, City of DeRidder, Louisiana, Washington, D.C., October 16, 1992.

Federal Emergency Management Agency, Flood Insurance Study, Beauregard Parish, Louisiana, Unincorporated Areas, Washington, D.C., May 3, 1990.

Federal Emergency Management Agency, Flood Insurance Study, Newton County, Texas and Incorporated Areas, Washington, D.C., September 21, 1998.

Kansas City Southern Railroad Company, Bridge A-759 over Sabine River, U.S. Army Corps of Engineers, Galveston District, Sabine River, Texas, Erosion Protection, U.S. 190 Bridge, Merryville, Louisiana, August 1991.

Louisiana Department of Transportation and Development, Office of Highways, Water Resources Technical Report No. 36, Magnitude and Frequency of Floods in Louisiana, Fourth Edition, F. N. Lee, Louisiana, 1985.

National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Climatological Data, Louisiana, Asheville, North Carolina, National Climatic Center.

Sabine River Authority, Sabine River Flood Study, January 1993.

Texas Department of Transportation, Replacement of State Highway 65 Bridge (Preliminary), April 1993; Plans of U.S. 190 Bridge; and Bridge Layout of State Highway 12 Relief Bridges (Preliminary), June, 1993.

U.S. Census Bureau, QuickFacts: Beauregard Parish, Louisiana, Retrieved November 12, 2015[a] http://quickfacts.census.gov/qfd/states/22/22011.html

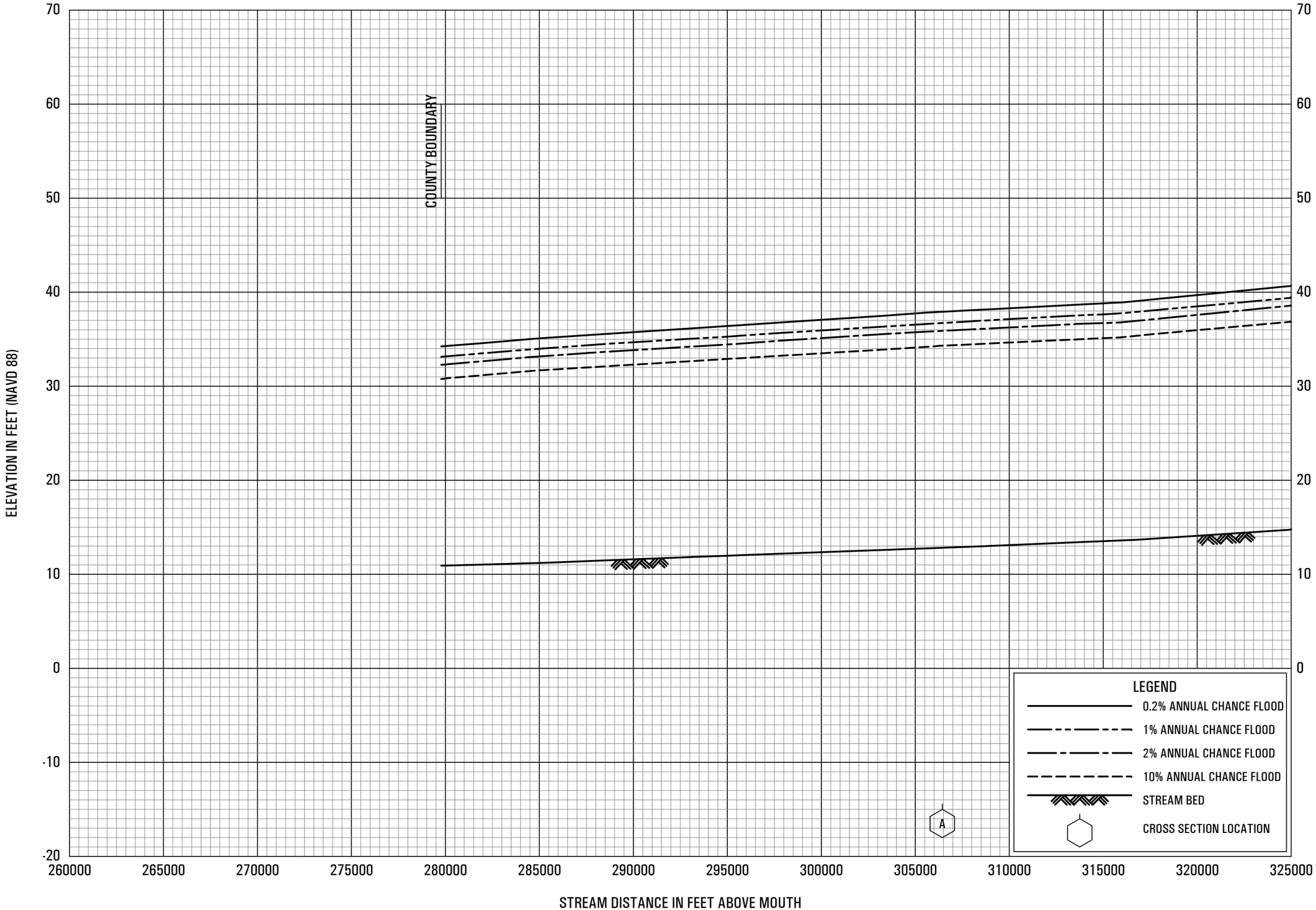
U.S. Census Bureau, QuickFacts: DeRidder, Louisiana, Retrieved November 12, 2015[b] http://quickfacts.census.gov/qfd/states/22/2220610.html

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Computer Program, Version 4.6, Davis, California, Revised February 1991.

U.S. Geological Survey, U.S. Department of the Interior, Water-Supply Paper 2207, Floods Characteristics of Urban Watersheds in the United States, V. B. Sauer, W. O. Thomas, Jr., V. A. Stricker, and K. V. Wilson, Washington, D. C., 1983.

U.S. Geological Survey, U.S. Department of the Interior, Federal Highways Administration, Office of Research and Development, FHWA/RD, Bridge Waterways Analysis Model (WSPRO)/Research Report by J. S. Shearman, W. H. Kirby, V. R. Schneider, and H. N. Flippo, Jr., Washington, D. C., 1986.

Wikipedia, http://en.wikipedia.org/wiki/Beauregard_Parish, Copyright 2000, updated September 2008.



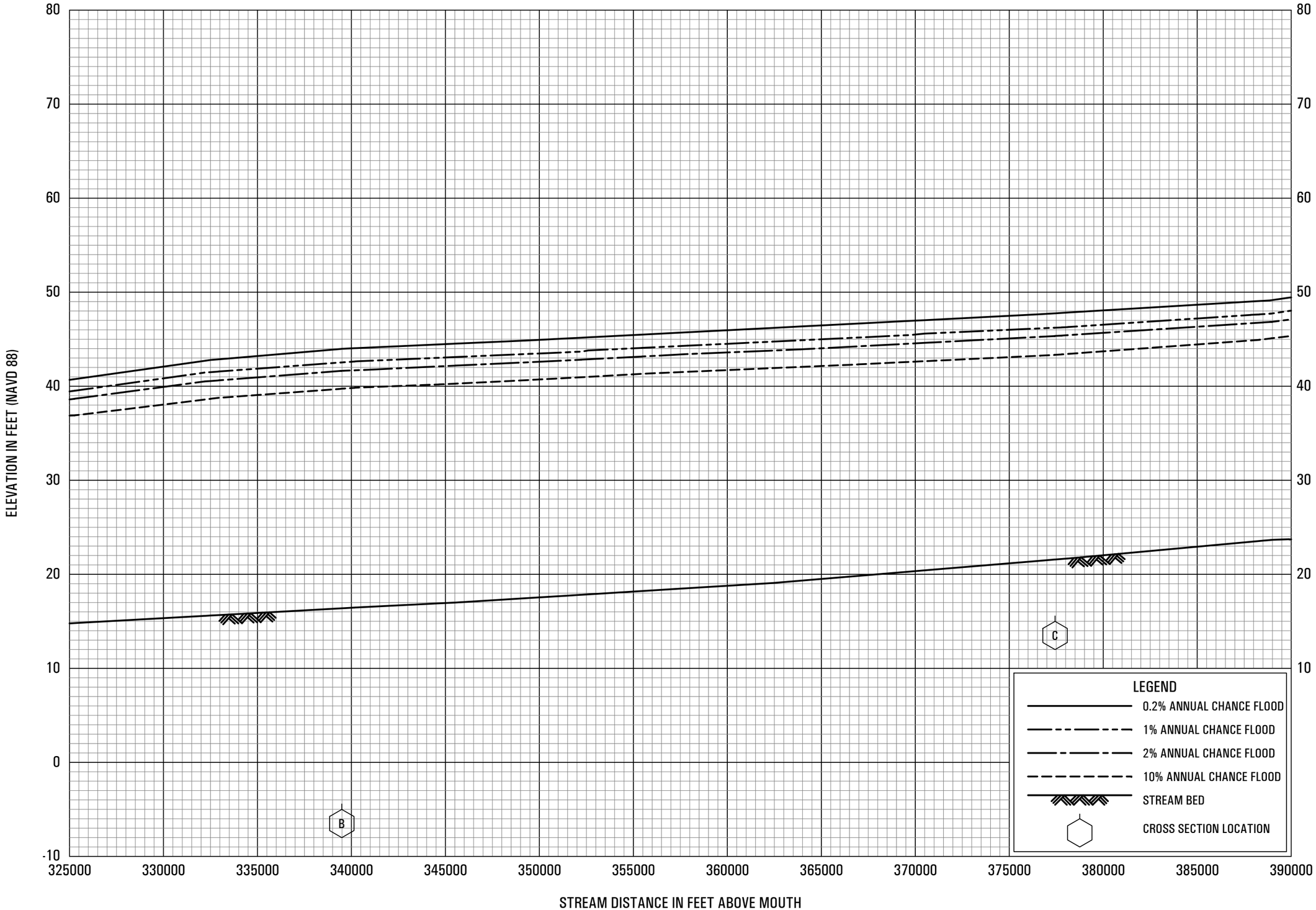
FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BEAUREGARD PARISH, LA

AND INCORPORATED AREAS



FLOOD PROFILES

SABINE RIVER

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BEAUREGARD PARISH, LA

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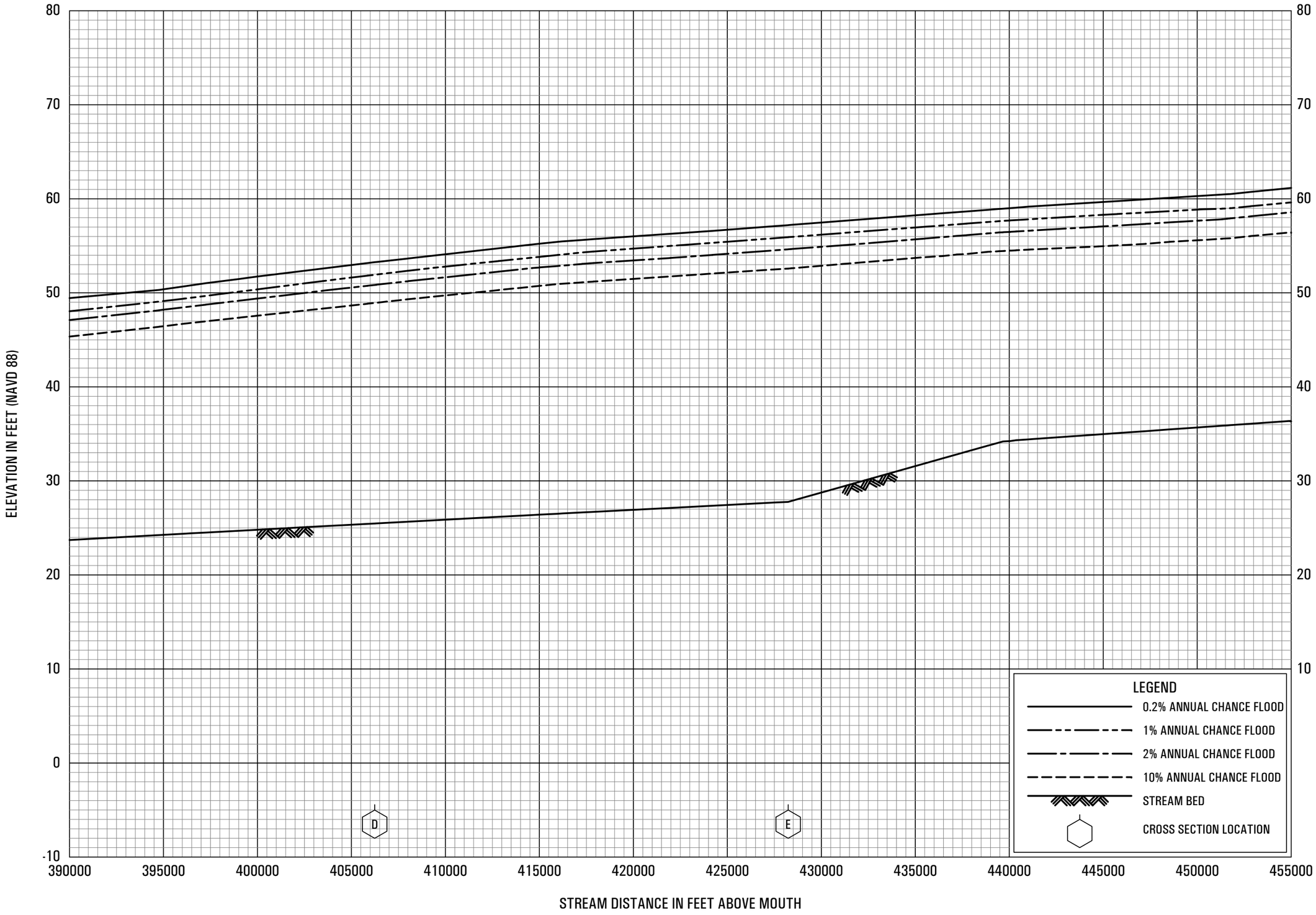

FLOOD PROFILES

SABINE RIVER

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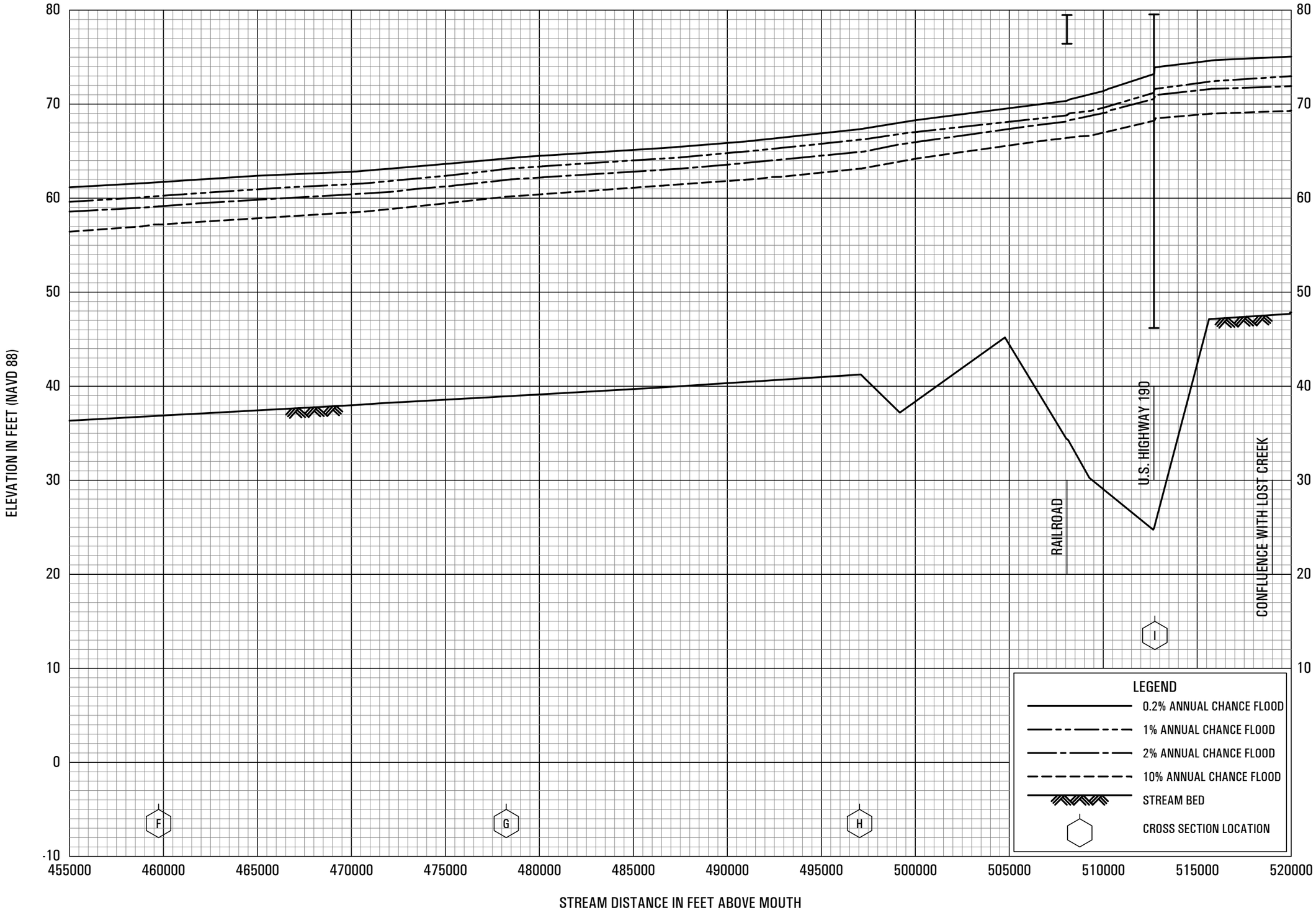

FLOOD PROFILES

SABINE RIVER

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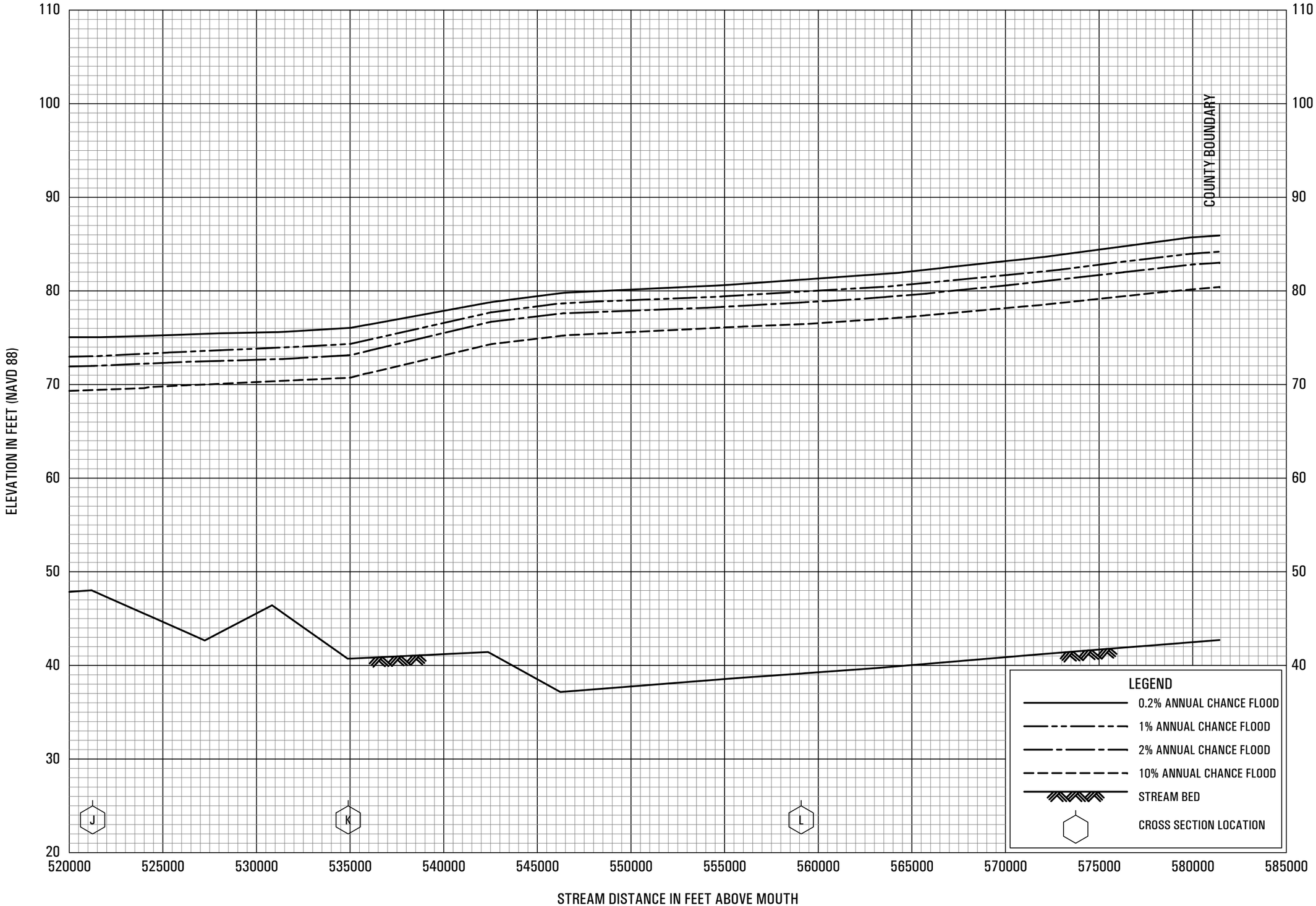

FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BEAUREGARD PARISH, LA

AND INCORPORATED AREAS