2022

BOARD OF DIRECTORS
JOSHUA W. ALLEN
BERNIE DALEO
CHARLES CHUCK GUILLORY
ANTHONY MALLEY
CHARLES CHUCK KIKER

GENERAL MANAGER
DR. JOSEPH G. MAJDALANI, P.E.

JEFFERSON COUNTY DRAINAGE DISTRICT NO. 6 (JCDD6) 2022 HAZARD MITIGATION PLAN UPDATE

DRAFT 11.2021

JEFFERSON COUNTY DRAINAGE DISTRICT NO. 6 (JCDD6)
HAZARD MITIGATION PLAN UPDATE

TABLE OF CONTENTS

Table List

Figure List

SECTION 1 – INTRODUCTION AND ADOPTION

This Plan is an Update

Jefferson County Drainage District No. 6 (JCDD6 or the District) has participated in Hazard Mitigation Plans (HMP) since 2005. The first plan was approved by the Federal Emergency Management Agency (FEMA) in 2006 and adopted by the Board of Directors in 2006. The Disaster Mitigation Act of 2000 (DMA, Section 201.6 (c)(4)(i)) requires a plan maintenance process, which includes reviewing and updating the plan every five years. Since 2006, the District has prepared and adopted approved plans in 2012 and again in 2017. This is the District's third plan update.

The intent of the current, updated plan, while incorporating much of earlier plans is to:

- Include any newly identified hazards or remove hazards that are no longer deemed a hazard
- Update the hazard/risk data
- Review and update development data
- Review, update or revise as necessary any changes in priorities, goals, and actions from the last plan
- Update the demographic information based on current information
- Provide progress in the local mitigation efforts
- Provide a planning process for key stakeholders and the public to review and a chance for input to the update and
- Review and update plans or reports for inclusion in this update of the plan

An important step in the process of improving resistance to hazards is the development of a hazard mitigation plan. The JCDD6 Hazard Mitigation Plan Update was prepared in accordance with the guidelines provided by FEMA and the Texas Division of Emergency Management (TDEM). The original JCDD6 HMP was prepared for several purposes. It set the stage for long-term disaster resistance through identification of actions that will, over time, reduce the exposure of people and property to hazards. Completion of the original plan, and adoption by the District's Board, was a significant step toward identifying potential hazards that threaten the JCDD6' jurisdictional area of responsibility, assessing risk, and implementing mitigation actions that will reduce property damages, injuries, and loss of life from hazards. Approval of the original plan and each subsequent update reviewed and approved by TDEM and FEMA also establish eligibility for certain mitigation grant funds. This HMP update continues the District's efforts to build a safe and resilient community and to be eligible for FEMA mitigation grants.

Summary

There are five sections of this plan all with the focus on the last five years 2016-2021 – the Introduction and Community Profile, the Planning Process, the Hazard Profiling and Risk Assessment, the Mitigation Strategy, and the Plan Maintenance section. Each section provides updates in the last five years to the natural hazards that threaten the District, the people and property exposed to those hazards, the planning process, how hazards are recognized in the District's normal processes and functions, and priority mitigation action items. As in past years, when taking into account, the magnitude of past events, the number of people and properties affected, and the severity of damage, flood hazards clearly are the most significant natural hazard

to threaten JCDD6 and its mandate to help mitigate against floods. Since the last plan update, the District has taken tremendous efforts to prevent flooding, however, it also faced some of its greatest challenges in these last five years, specifically 2017 with Hurricane Harvey and 2019 with Hurricane Imelda.

Notable changes to this plan from the last iteration are as follows:

- After a review of a hazard, if the hazard occurs in the area and has not been fully mitigated by the jurisdictional authority of the District, it was included. This includes a drought, extreme heat and winter storms.
- The goal has been updated from earlier versions.
- Recognizing the importance of external stakeholder and public review of understanding the hazard mitigation plan, the District did more outreach to solicit these two important group's views and expertise.
- Drought and extreme heat are treated as one hazard

Adoption by JCDD6 Board of Directors

The District advised the Board of Directors of its intent to update the hazard mitigation plan but refrained from presenting the updated plan for adoption until after public review and incorporation and then submission for review and approval by the Texas Division of Emergency Management (TDEM) and the Federal Emergency Management Agency (FEMA). Upon receiving notice from FEMA that this plan is approved pending adoption (APA), which indicates there are no more changes required by FEMA to the Plan, JCDD6 will formally adopt the plan and include the Board of Director's formal resolution in the document.

Community Profile

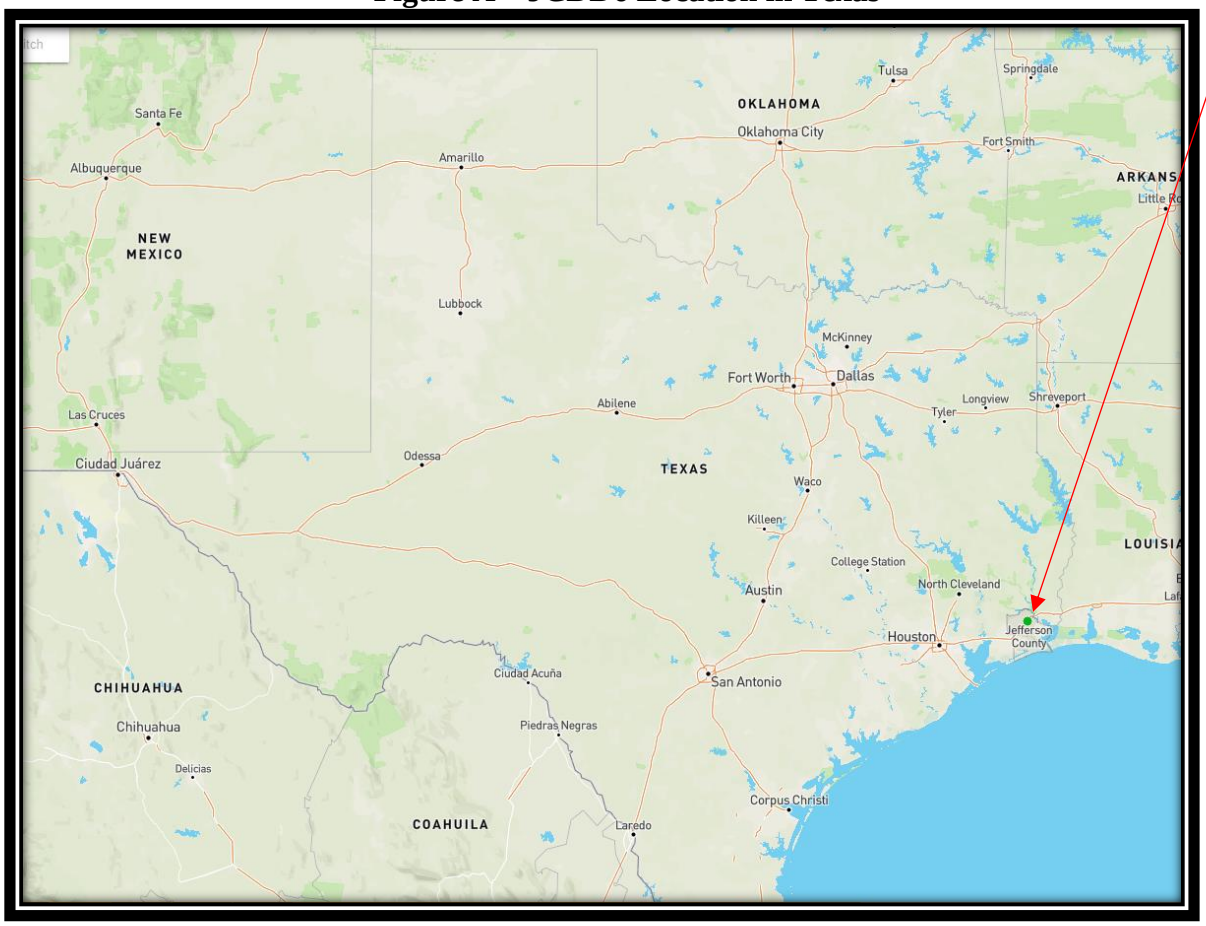
The area covered by Jefferson County Drainage District No. Six (JCDD6) is located in southeast Texas. The City of Beaumont is the county seat and the largest city of Jefferson County. The District is situated approximately 85 miles east of Houston, approximately 70 miles northeast of Galveston, and 275 miles southeast of Dallas (Figure A). Ground surface elevations across JCDD6 vary from 40 feet to 3 feet above mean sea level. The topography is described as nearly flat prairie and the geologic structure is nearly flat strata. The bedrock types are comprised of deltaic sands and muds. Data from the Bureau of Economic Geology, at the University of Texas at Austin, identifies the land as "expansive clay and mud – locally silty, locally calcareous, flat to low; hilly prairie; commonly tilled".

Planning Area

The District's jurisdictional boundaries are set in the Northern area of Jefferson County and include Beaumont, Bevil Oaks, China, and Nome as well as the communities of Fannett, Northwest Forest, Hillebrandt Acres, Cheek, and LaBelle and all the farm and timberland in between. Within this area, there are over 1,070 linear miles of streams, channels, and outfalls, along with 40 detention basin facilities all under the jurisdiction and control of the District. The other boundaries in which the District operates – those provided by nature – are the five primary watersheds within District and each presents unique challenges. All incorporated and unincorporated areas rely heavily on the District to provide outfall drainage and flood relief.

JCDD6

Figure A – JCDD6 Location in Texas



JCDD6 consists of approximately 502 square miles and lies entirely within Jefferson County and the City of Beaumont. Figure B is a map identifying the boundary area (outlined) for JCDD6. The Hazard Mitigation Plan Update is prepared for the entire District.

Figure B – JCDD6 Boundaries

Climate

The climate of southeastern Texas is generally classified as subtropical, where prevailing southeastern winds from the Gulf of Mexico result in high temperatures and humidity. Severe weather occurs as tropical storms and hurricanes, which are associated with strong winds and heavy rainfall, winter northern frontal passages, and occasional tornadoes. Summers are hot and humid and characterized by afternoon thunderstorms. The average high temperature for July and August is about 93°F. Winters are cool and temperate, with some rain and the rare snowfall. The coolest month is January with an average temperature of 51.8° F. The average annual temperature is 69 ° F.

Jefferson County receives an average of 60.4 inches of precipitation each year. Normal monthly rainfall in the area varies from about three inches to over five inches with the heaviest rainfall during the hurricane season, June through November.

Population and Growth

The entire State of Texas has grown by nearly 15.9% from 2010 to 2020. Jefferson County, of which JCDD6 is a part of, grew 1.7% (252,273 in 2010 estimate to 256,526 in 2020 estimate). Jefferson County includes both incorporated and unincorporated areas and areas outside of JCDD6' jurisdiction. The population totals for the eight incorporated areas within the County are identified in Table 1-1. As indicated in the table, the cities of Beaumont, Bevil Oaks, China, and Nome are located within the District's boundaries. The population of the four cities within the District's planning area consists of over half the County population. The remaining incorporated areas are located outside of the planning area. The population of unincorporated Jefferson County totals 30,961. Approximately half of unincorporated Jefferson County is with JCDD6's boundaries.

Table 1-1 - Incorporated Areas of Jefferson County (Source: US Census Bureau, 2020 – Decennial Census)

City	2014 Overall Population Estimates	Overall 2020 Population	Within JCDD6 Jurisdiction	Population within JCDD6 Jurisdiction
Beaumont	117,585	116,825	Yes	116,825
Bevil Oaks	1,244	1,089	Yes	1,089
China	1,124	1,260	Yes	1,260
Nome	561	469	Yes	469
Groves	15,753	17,335	No	N/A
Nederland	17,108	18,856	No	N/A
Port Arthur	54,540	56,039	No	N/A
Port Neches	12,755	13,692	No	N/A
Total Cities	220,673	225,565		119,643
Unincorporated Jefferson County	31,562	30,961	Yes	15,481
TOTAL				135,234

The table below is from US Census Bureau Quick Facts for Jefferson County for 2019 (which had a population estimate of 251,565 in 2019) and indicates the population breakdown with approximately 24.1% under 18 years old, 14.9% was 65 years and older. It is helpful to understand the breakdown of population to help identify potential vulnerable populations.

Table 1-2 – Age Population Breakdown for Jefferson County, 2020 Census Quick Facts

Population estimates, July 1, 2019, (V2019)	251,565
PEOPLE	
Population	
Population estimates, July 1, 2019, (V2019)	251,565
Population estimates base, April 1, 2010, (V2019)	252,277
Population, percent change - April 1, 2010 (estimates base) to July 1, 2019, (V2019)	-0.3%
Population, Census, April 1, 2020	256,526
Population, Census, April 1, 2010	252,273
Age and Sex	
Persons under 5 years, percent	⚠ 6.9%
Persons under 18 years, percent	⚠ 24.1%
Persons 65 years and over, percent	⚠ 14.9%

ACS DEMOGRAPHIC AND HOUSING ESTIMATES

Survey/Program: American Community Survey

Product: 2019: ACS 1-Year Estimates Data Profiles

TableID: DP05

	Jefferson County, Texas			
Label	**Estimate**	**Margin of Error**	**Percent**	**Percent Margin of Error**
SEX AND AGE				
Total population	251,565	*****	251,565	(X)
Male	128,622	±457	51.1%	±0.2
Female	122,943	±457	48.9%	±0.2
Sex ratio (males per 100 females)	104.6	±0.8	(X)	(X)
Under 5 years	17,118	±291	6.8%	±0.1
5 to 9 years	18,169	±2,271	7.2%	±0.9
10 to 14 years	15,748	±2,255	6.3%	±0.9
15 to 19 years	15,328	±1,001	6.1%	±0.4
20 to 24 years	17,549	±967	7.0%	±0.4
25 to 34 years	36,064	±683	14.3%	±0.3
35 to 44 years	32,516	±433	12.9%	±0.2
45 to 54 years	29,593	±569	11.8%	±0.2
55 to 59 years	15,745	±1,739	6.3%	±0.7
60 to 64 years	17,393	±1,611	6.9%	±0.6
65 to 74 years	20,829	±569	8.3%	±0.2
75 to 84 years	11,028	±937	4.4%	±0.4
85 years and over	4,485	±901	1.8%	±0.4
Median age (years)	37.1	±0.5	(X)	(X)

In addition to identifying potential vulnerable populations, it is helpful to understand the population trend historically to demonstrate potential growth trends. For Jefferson County, population growth since 2014 has been minimal. Another trend to review is housing trends. Housing trends are also important to help with long term planning for an area. A review of permit activity in three of the incorporated cities in Jefferson County continues to grow. Table 1-3 shows the number of residential and commercial permits filed from 2017-2021 showing an overall increase in both sectors, even though some years had less permits than the year before.

Table 1-3 - 2019 Nome and China New Building Permit Totals by Year

	Beaumont Residential	Nome Residential	China Residential	Beaumont Commercial	Nome Commercial	China Commercial	Total
2017	129	4	48	37	0	1	219
2018	152	8	39	47	0	0	246
2019	247	1	59	35	0	0	342
2020	317	6	36	43	0	0	402
2021	398	1	25	46	0	1	471
Total	1,243	20	207	208	0	2	1,680

In addition, to permit information, the US Census Quick Facts reports data on housing trends. In 2015-2019, Jefferson County, Texas had a total of 109,133 housing units. Of these housing units, 61.1% were owner occupied with 1,115 building permits for 2020. This number represents the number of new privately owned housing units authorized by building permits in Jefferson County. This number is a general indication of the amount of new housing stock that may have been added to the housing inventory.

In terms of households, the Census reports there ae 92,988 households in Jefferson County. The average household size was 2.56. The units by structure were 73.4%% 1- unit (e.g., single family home), 23.2% 2 or more unit structures, and mobile homes or other types 3.3%.

Table 1-4 - US Census Population Estimates, Jefferson County 2015-2019 American Community Survey 5 Year Estimates

US Census Housing, Family and Income Estimates, Jefferson County , TX	July 1, 2019
Housing Units, July 1, 2019	109,133
Owner-occupied housing unit rate, 2015-2019	61.1%
Households, 2015-2019	92,988
Median value of owner-occupied housing units, 2015-2019	$112,000
Median selected monthly owner costs -with a mortgage, 2015-2019	$1,359
Median selected monthly owner costs –without a mortgage, 2015-2019	$424
Median gross rent, 2015-2019	$871
Persons per household, 2015-2019	2.56

US Census Housing, Family and Income Estimates, Jefferson County , TX	July 1, 2019
Medium household income, 2015-2019	51,248

Albeit minimal, this growth has increased the amount of people and property at risk from natural hazards. Jefferson County enforces their floodplain ordinance, with a one-foot freeboard requirement above base flood elevation (Beaumont has a one-foot and six-inch requirement) and requires all new construction to be designed and constructed to withstand 140 mile per hour wind loads, which significantly reduces the potential vulnerability of new development to hazards that have had the highest historical impact on property.

Household Income and Education

The median household income for Jefferson County was an estimated $51,248 (Source: Quick Facts, Jefferson County, Texas, US Census Bureau) compared to $59,570 for the State of Texas. Residents of the County education statistics have approximately 19.7% of the adult population holding a four-year degree or higher and 84.2% reporting to have finished high school and gone on to post-secondary education.

Place of Work

While addressing potential hazards, it is important to note that much of the workforce in Jefferson County is mobile and works within 20 minutes from home. Beaumont is the largest City within the County. The Beaumont Chamber of Commerce reports that employment in Beaumont has been growing at an annual rate of 2.04 % from 49,278 employees in 2014 to 55,410 employees in 2018.

The Chamber also reports there are approximately 6,301 businesses located in Beaumont. Table 1-5 lists the major industries, number of employees and number of establishments.

Table 1-5 – Major Industries in Beaumont (Source: Beaumont Chamber of Commerce)

Industry	Jobs	Establishments
Healthcare and Social Services	13,472	1,140
Retail	10,642	877
Accommodation and Food Services	7,377	371
Public Administration	6,585	193

District Facilities

JCDD6 own one complex of buildings located on Walden Road in Beaumont (Figure C – red circle). These buildings are not located in the Special Flood Hazard Area and have never

experienced flooding. Figure D shows the locations of all of the alert stations. In addition to the facilities, the District also owns other assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles totaling to $22,892,359 in insured value. These vehicles are mainly stored on District property, not in a floodplain. However, some of these vehicles are often in use and at various projects sites that may sit in a flood prone area. The District closely monitors weather and takes proactive steps, when possible, to move vulnerable equipment to higher ground when equipment is being operated or staged in a flood prone area. However, even with such precautions, an event like Hurricane Harvey four vehicles not located at the District's facilities were flooded and there was damage to a dozer, storage building, and excavator were damaged at a job site.

Figure C – JCDD6 Facilities

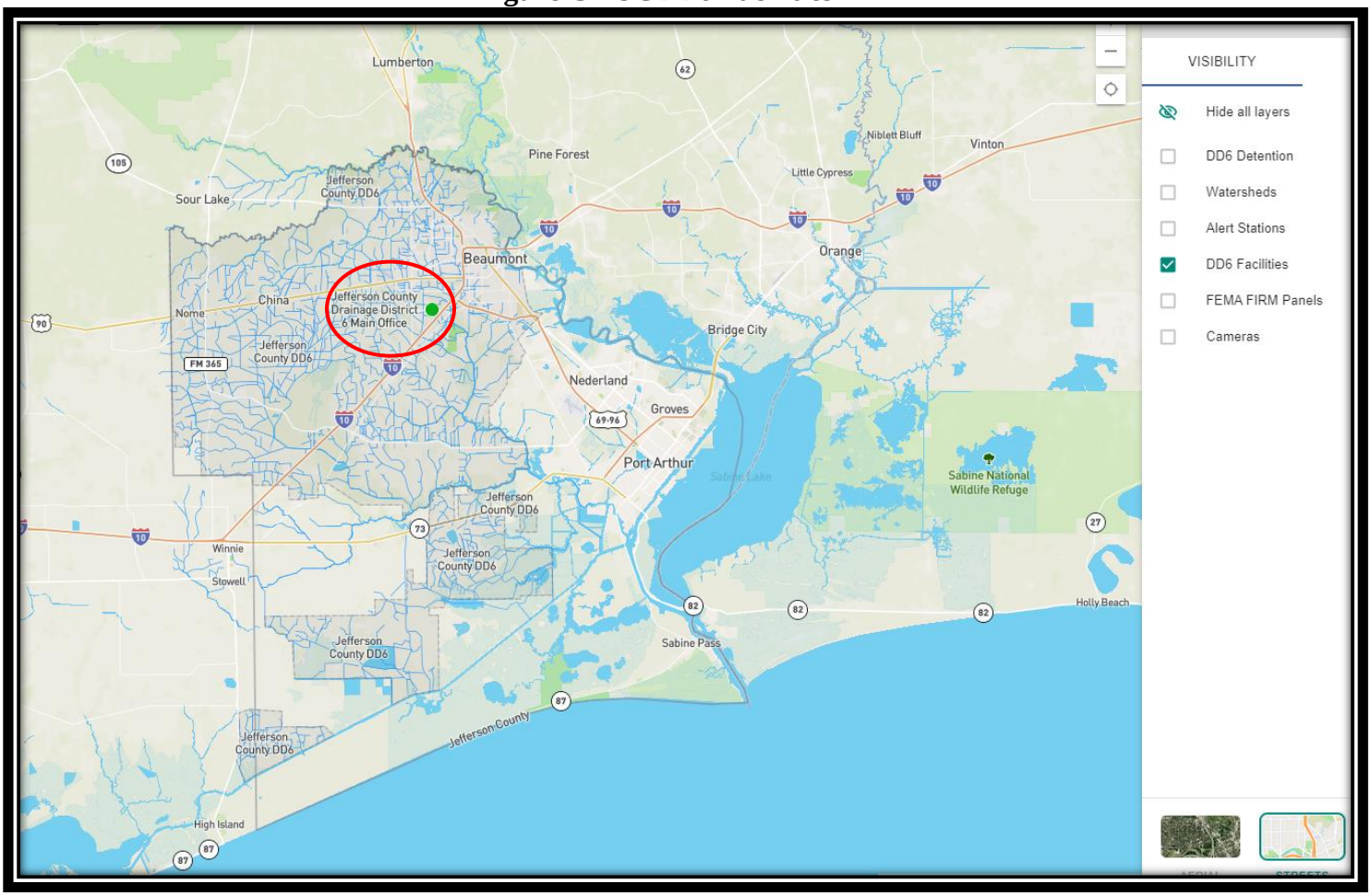
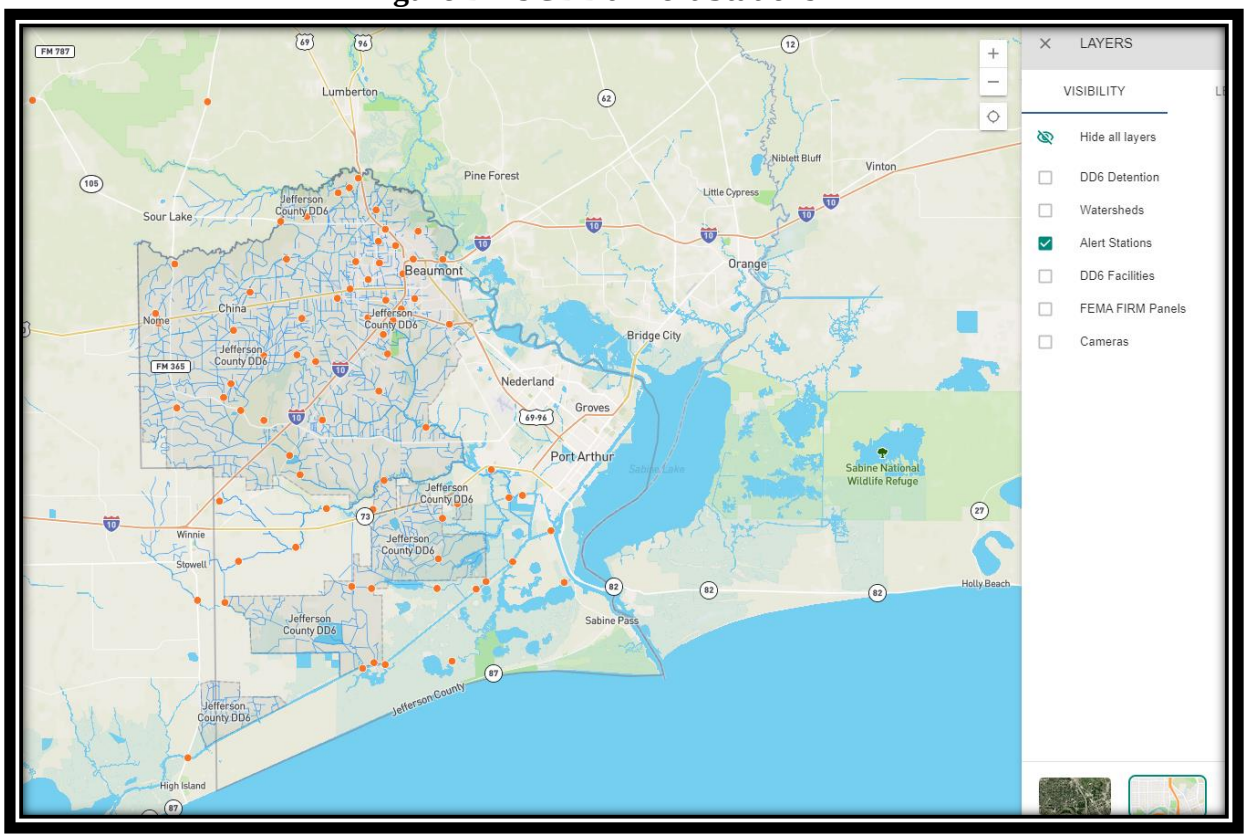


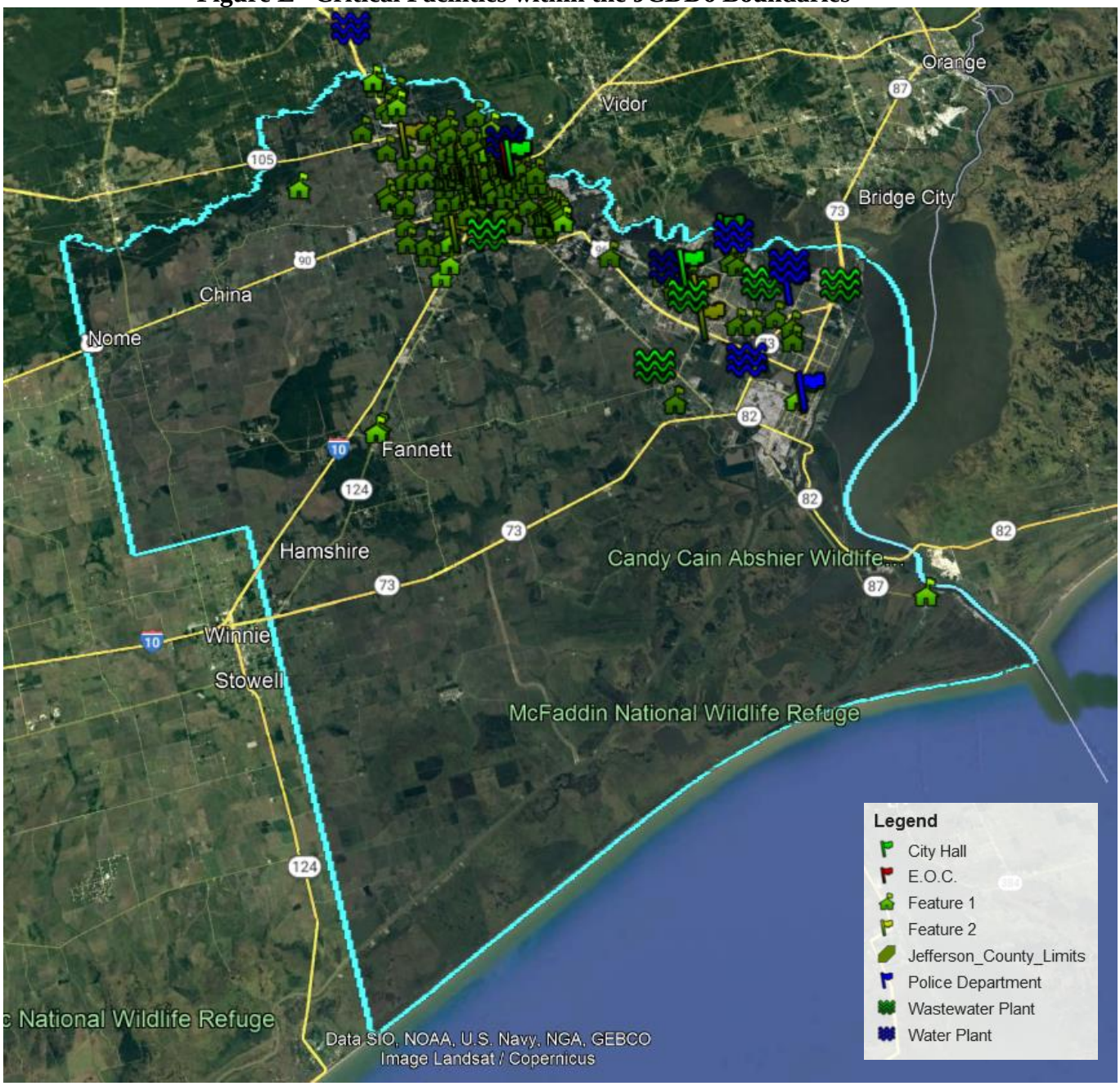
Figure D – JCDD6 Alert Stations



Other Critical Facilities

There are several critical facilities within the District's boundaries (e.g.: hospitals, schools, nursing homes, Police, Fire and EMS stations, City and County Buildings, wastewater treatment facilities) While the County and the Cities are responsible for these assets, the District works with them if there are flooding issues. Figure E is a map of the critical facilities within the District's boundaries.

Figure E– Critical Facilities within the JCDD6 Boundaries



JCDD6 Hazard Mitigation Plan Update Goal

The first two iterations used the same Goal Statement that included four bullets to protect, to reduce losses, to facilitate the development of review and approval processes with the **c**ommunities and to seek solutions to the existing problems. After review of this goal, two bullets were merged, and a new bullet was added include increasing cooperation and

coordination among local, state and federal agencies and private entities. The updated goal is as follows:

JEFFERSON COUNTY DRAINAGE DISTRICT NO. 6 HAZARD MITIGATION GOAL

The creation of the Jefferson County Drainage District No. 6 ("the District") was to make drainage improvements in the jurisdictional boundaries it serves. This role was further expanded as a conservation and reclamation District allowing the District to further conserve the natural resources of the State and help to mitigate health and safety hazard. The continuing mission of the District is to provide flood damage reduction projects that work with appropriate regard for community and natural values. It is this mission and aligning this mission to the State's goals that drives the goals.

Therefore, the goal of this plan is to support the District's efforts to protect the community's health, safety, and welfare by identifying and increasing public awareness of natural hazards and mitigating risks due to those hazards without creating new problems. In addition, The District will work to:

- Protect public health, safety, and welfare and natural resources;
- Reduce losses due to hazards by identifying hazards, minimizing exposure of citizens and property to hazards, and increasing public awareness and involvement;
- Facilitate the development review and approval process to accommodate growth in a practical way that recognizes existing stormwater and floodplain problems while avoiding creating new problems or worsening existing problems;
- Reduce adverse environmental, natural resource, and economic impacts from natural, hazard events; and
- Increase cooperation and coordination among private entities, local agencies, State

SECTION 2 – THE PLANNING PROCESS

Update from the Last Plan

- Added detailed local capabilities assessment, integration and area of improvement

The Purpose of the Plan

The Federal Disaster Mitigation Act of 2000 (Public Law 106-390), referred to as the 2000 Stafford Act (DMA 2000), was approved by Congress on October 10, 2000. The Act intended to assist communities in reducing their risk from natural hazards by identifying resources, information and strategies for risk reduction; and through careful planning and collaboration among public agencies, stakeholders and the public; prepare and regularly update mitigation plans. To implement the DMA 2000 planning requirements, FEMA prepared an Interim Final Rule, published in the Federal Register on February 26, 2002, which established planning and federal funding criteria for states and local communities. The Act required both state and local governments to develop hazard mitigation plans as a condition for federal grant assistance. These plans must be updated, reviewed, and approved every five years.

The Mitigation Planning Process

JCDD6 followed a well-established planning process to update its Hazard Mitigation Plan (HMP). The process is fully documented below. The District maintains a copy of the original and updated plans, which can be reviewed upon request.

The mitigation planning process for the 2022 HMP update was facilitated by a mitigation planning consultant. The plan update process followed the FEMA Local Hazard Mitigation Plan regulations set forth in 44 Code of Federal Regulations (CFR) Part 201.6, and is FEMA's official source for defining the requirements for original and updated local hazard mitigation plans. In addition, the FEMA Local Mitigation Planning Handbook (March 2013) was used as a practical guide to ensure all requirements were satisfied for this update.

The Mitigation Planning Committee (MPC) was reconvened. The MPC leads the review and draft of the update. During the first meeting, the team identified members who are no longer working in their respective positions and additional members who needed to be included on the MPC. Table 2-1 lists the MPC for this plan update. Minutes were prepared for each meeting to document the process and keep the plan on task. Those minutes can be found at the end of the plan in Appendix A.

Table 2-1 - Mitigation Planning Committee for the JCDD6 HMP Update

Team Member	Title	Department	Role/Responsibility
Joseph Majdalani	General Manager	JCDD6	Data collection, analysis of hazards, identify actions Review drafts
Doug Canant	District Engineer	Engineering	Data collection, analysis of hazards, identify actions Review drafts

Team Member	Title	Department	Role/Responsibility
Butch Wilson	Asst. District Engineer	Engineering	Data collection, analysis of hazards, identify actions Review drafts Mapping support
Karen Stewart	Chief Business Officer	Procurement	Data collection, analysis of hazards, identify actions Review drafts
Chuck Oakley	Chief Financial Officer	Finance	Data collection, analysis of hazards, identify actions Review drafts
Kristen Thatcher	Plan Coordinator	JSWA	Drafting plan based on updates, data and analysis from MPC, ensuring requirements are met for plan and, incorporating comments received from Stakeholders and Public
Dan Ward	Plan Coordinator	JSWA	Drafting plan based on updates, data and analysis from MPC, ensuring requirements are met for plan and, incorporating comments received from Stakeholders and Public

Early in the planning update process, the MPC undertook a detailed review of every section of the existing plan. The MPC identified all the subject areas where specific updates were required. For example, census figures, the numbers and locations of District-owned buildings, impacts of recent hazard events (including Hurricane Harvey and Imelda), as some examples. The second purpose of the review was to ensure that the updated plan is fully compliant and responsive to all of the FEMA requirements. The review indicated that while changes and updates were needed throughout the document, most of the modifications were relatively limited as hazards did not change significantly and did not require a significant initial public component such as focus groups or surveys. The MPC met several times during the update process.

The first meeting took place on September 24, 2021. The purpose of the meeting was to begin the planning process, finalize the MPC membership, to make certain decisions about contents of the plan, and to assign specific tasks to District staff and consultants. Most of the tasks were related to updating information and maps as well as identifying which areas (of each section) required updates. Each section of the current plan was then reviewed and analyzed to determine which areas required update. This included areas of the plan such as the hazards profiled (and hazard data), the risk assessment, goals, maps, status from action items in the last iteration of the plan and new action items. A schedule for the plan update was prepared, see Table 2-3.

The second MPC meeting was held on September 30, 2021. The purpose of the meeting was to review the status of various tasks, to finalize the stakeholders, review the status of the mitigation actions from the current plan and finalize the draft, revised goal statement. The Stakeholders are individuals or groups that are affected by a mitigation plan and/or have or specific knowledge or expertise in an area that can be helpful with the update and were invited to participate by a formal letter (see Appendix B). The Stakeholders for this update are listed in Table 2-2.

As part of the plan update, certain elements of the original plan have been retained, and irrelevant or outdated information has been edited or removed. Focus of the plan update included incorporating new hazard information, re-evaluating the District's risk assessment, and developing and prioritizing potential mitigation actions and projects.

Table 2-2 - Stakeholders for JCDD6 Hazard Mitigation Plan Update

Organization	Point of Contact	Title	Method of Invite
Sabine Neches Navigation District	Randall Reese	Executive Director & CEO	Letter
Beaumont Independent School District	Shannon Allen	Superintendent	Letter
Hardin-Jefferson Independent School District	Brad McEarchern	Superintendent	Letter
Hardin-Jefferson Independent School District	Miracie Daniel	Safety Director	Letter
Hamshire-Fannett Independent School District	Dwayne Augustine	Superintendent	Letter
Lamar University	Jaime Taylor	President	Letter
Lamar Institute of Technology	Lonnie Howard	President	Letter
Baptist Hospitals of Southeast Texas Foundation	Kim Moncia	Executive Director	Letter
Christus Southeast Texas	Paul Trevino	CEO	Letter
Jefferson County Drainage District No. 7	Phil Kelley	General Manager	Letter
Jefferson County Drainage District No. 3	Fred Folsom	Superintendent	Letter
Texas Department of Transportation	Patrick Ryan	Area Engineer – Beaumont	Letter
Lower Neches Valley Authority	Scott Hall	General Manager	Letter
Goodyear Tire and Rubber Co.	Gloria Blanco	Plant Manager	Letter
Southeast Texas Regional Planning Commission	Steve Curran	Homeland Security Director	Letter
Southeast Texas Regional Planning Commission	Kaylin Arendale	Homeland Security	Letter
City of Nome	Kerry Abney	Mayor	Letter
City of China	William Sanders	Mayor	Letter
City of Bevil Oaks	Doug Mullins	Mayor Pro-Tem	Letter
City of Beaumont	Adina Josey	Floodplain Administrator	Letter
City of Beaumont	Tim Ocnaschek	Emergency Management – Coordinator	Letter

Organization	Point of Contact	Title	Method of Invite
City of Beaumont	Shaqueena Nobles	Emergency Management – Deputy	
Greater Beaumont Chamber of Commerce	Bill Allen	President and CEO	Letter
Exxon Mobil Corporation	Nakisha Burns	Beaumont Area Public and Government Affairs Manager	Letter
Exxon Mobil	David Gorsich	SSH&E Manager, Beaumont Complex	Letter
Jefferson County	Michael White	Emergency Management Coordinator	Letter
Liberty County	Crista Beasley	Emergency Management Coordinator	Letter
Hardin County	Aaron Tupper	Emergency Management Coordinator	Letter
Orange County	Joel Ardoin	Emergency Management Coordinator	Letter
Chambers County	Ryan Holzaepfel	Emergency Management Coordinator	Letter

During the third meeting on October 22, 2021, the MPC focused provided the details for the new actions and then prioritization. Also discussed was the plan maintenance process.

The November 5, 2021, focused on reviewing the draft presentation and draft plan for the first public meeting.

The team presented the initial draft to the public on November 9, 2021, presentation can be found in Appendix C.

Table 2-3 – Plan Update Schedule

Date	Description
9-24-21	MPC Meeting
9-30-21	MPC Meeting
10-22-21	MPC Meeting
11-5-21	MPC Meeting
11-9-21	**First Public Meeting**
11-16-21	MPC Meeting. Comments from first public meeting incorporated. Draft updated
11-18-21	Letters to Stakeholders sent with draft
11-23-21	**Second Public Meeting**
11-23-21	Plan uploaded to District website and public given 30 days to review and provide comments
12-23-21	**Comment Cycle closes and comments incorporated**
12-28-21	Plan is finalized and sent to TDEM for review process

The MPC met November 16, 2021, to review initial input from the public and further refined the draft. The MPC finalized the draft for stakeholder input and the email letter was sent on November 18, 2021, for stakeholder review and comment.

The MPC presented the draft to the public on November 23, 2021, explaining how the public can retrieve the draft and provide comments and input due back to the District by December 23, 2021.

ADD PARAGRAPH AFTER PUBLIC COMMENT WAS RECEIVED AND SUBMISSION OF THE FINAL PLAN TO TDEM FOR REVIEW.

Documentation of the Planning Process

It is important to document the planning process to inform the public and other readers about the overall approach to the plan update and to document who participated and how decisions were reached. To facilitate this documentation:

- Minutes were maintained for the MPC meetings.
- A letter was forwarded to the stakeholders to describe their role in the plan and planning effort and specify the means to provide that input. An example is attached to the plan update in Appendix B.
- The MPC presented to the public the plan goals, recommended changes to hazards and a discussion of mitigation actions. The presentation and the announcement are attached in Appendix C.
- With a completed draft, the Stakeholders were sent the draft requesting comments and those comments were incorporated.
- The MPC presented the draft plan update to the public to initiate public review and comment. The draft plan update was posted to the District's website and was mailed to interested parties upon request. The public was informed how to provide input during a 30-day comment period. The public announcement is attached (Appendix D) and presentation (Appendix E).
- ADD PARAGRAPH ABOUT COMMENTS RECEIVED DURING 30 DAY REVIEW. The MPC finalized the draft and submitted it to TDEM for review and FEMA approval.

Community Participation

Consistent with the District's standard practice of informing, engaging and involving citizens, and to fulfill public participation requirements of the mitigation planning programs, the District publicized the initiative, invited residents to review the plan update and solicited public comment.

During this plan update process, the public was involved by requesting their attendance and participation in two public presentations/meetings at District's office. The first meeting held on November 9th at 5 pm. The District followed its notice procedures to announce the meeting to the public. For the second public meeting, preliminary drafts of the plan update were available for public review, and the public was invited to provide input on the document for 30 days. ADD PARAGRAPH ABOUT COMMENTS RECEIVED DURING 30 DAY REVIEW. For the draft update, The District published public notice on DATE about the draft plan in *The Beaumont*

Enterprise before the meeting (See Appendix D, Public Notice Document) and on the District's website.

Local Capabilities Assessment and Integration

Jefferson County Drainage District No. Six (JCDD6) is a conservation and reclamation district and a political subdivision of the State of Texas. JCDD6 was established January 21, 1920, after a favorable vote on January 10, 1920. It was extended and enlarged (Vol. 63, P.478) according to the authority of the 57th Legislature, Chapter 349, and Chapter 7, Title 128, Revised Civil Statutes of Texas, Art. 8129. Since its creation, the role of the District has been increasingly complex. In 1961 through legislation (HB 1063), which also established JCDD6 as a Conservation and Reclamation District under Section 59, Article XVI, Texas Constitution, also enlarged the District. JCDD6 was created primarily to provide drainage of overflow lands within its boundaries. JCDD6 is governed by a five-member Board of Directors, appointed by the County Commissioners Court of Jefferson County, Texas. The Board appoints a General Manager who oversees the operations of the District including Engineering, Operations, Construction, Maintenance, Human Resources and Finance. The Board and the General Manager and staff provide community leadership, develop policies to guide the District in delivering projects and services in support of the community, and encourage citizen awareness and involvement.

The Capability Assessment describes the tools in the District's toolbox for implementing mitigation actions to reduce disaster losses and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects. These tools can be grouped into the following categories (see Figure F):

Figure F – Categories for Capabilities Assessment

The District works hard to ensure that all of the departments work collaboratively on hazard mitigation issues, with strong integration so that all departments can provide expertise and resources and are informed of mitigation decisions and actions. Table 2-4 lists the District's Departments and how they are involved mitigation, recognizing that some departments support the lead department for mitigation efforts.

With respect to planning for and responding to natural hazard events, the key element of the District is well equipped in all four categories.

Table 2-4 – JCDD6 Departments Involved in Mitigation Efforts

Department	Mitigation Support
Engineering Department	Surveying Drafting and GIS Project Design Project Estimation Project Oversight and Administration Drainage Studies Planning Specifications Preparation Grant Application and Management Support Consultant Engineer Management Permit review
Finance Department	Financial reporting Payments Reimbursements Audits
Human Resources and Risk Management Department	Reporting requirements Grant requirements
Operations/Maintenance Department	Construction of projects Maintenance and management of projects
Purchasing Department	Purchasing Policies Competitive Procurement for grants

Administrative and Technical Resources

JCDD6 has many of the staff trained and skilled to support mitigation planning and actions including:

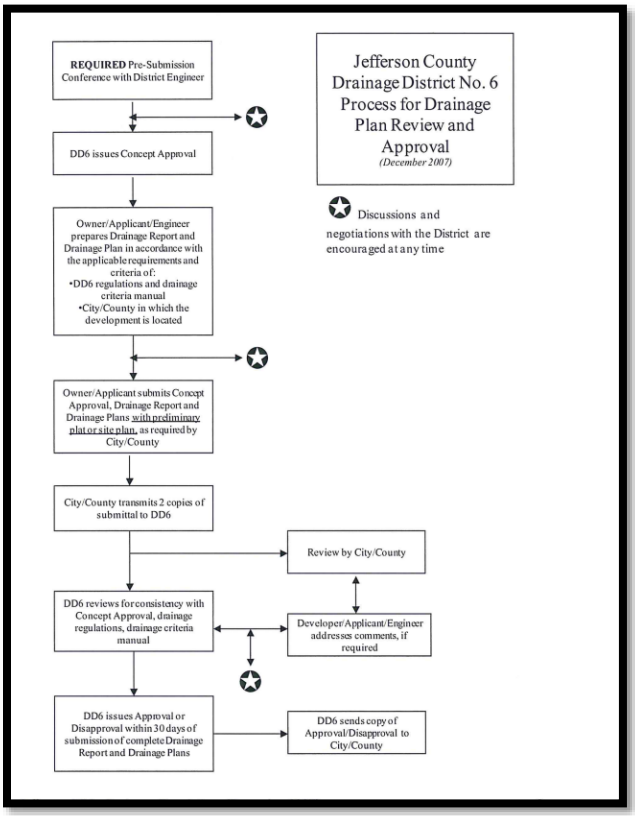
- Floodplain Managers
- Civil Engineers
- GIS Coordinators and
- Procurement and Finance experts
- Grant administrators

The staff is well trained on hazards and mitigation, well-coordinated within and between departments for mitigation and effectively enforces regulations in support of mitigation.

Administrative and technical resources - refers to the community's staff and their tools and skills that can be used for mitigation planning and to implement specific mitigation actions. It also refers to the ability to access and coordinate these resources effectively.

Drainage Regulations. The District published a Drainage Criteria Manual to support the Master Drainage Plan and Drainage Regulations adopted by the District pursuant to the Texas Water Code Section 49.211. The express intent of the drainage regulations is that the 100-year peak flow runoff within the boundaries of subdivisions and developments, be conveyed safely, that these flows have flow paths to the most appropriate District outfalls, that along the flow paths property is not adversely impacted by these flows, and that it be demonstrated that the receiving District outfalls and ditches have the capacity to convey the additional flows without increasing downstream flooding. The manual provides clear drainage plan review and approval. Figure G illustrates the review and approval process flow.

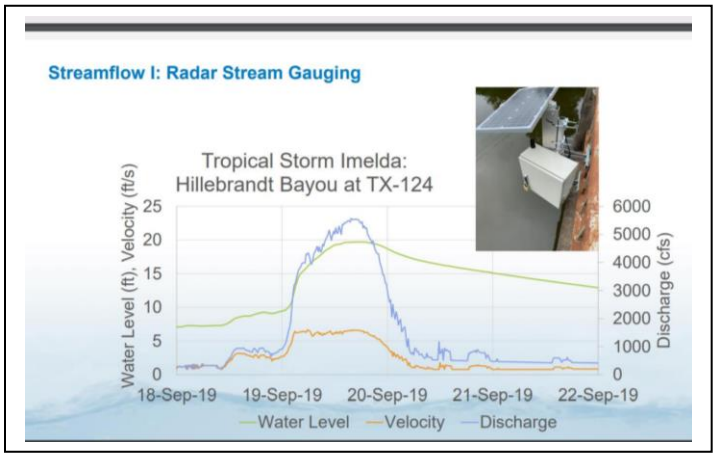
Figure G - JCDD6 Process for Drainage Plan Review and Approval



Jefferson County and the incorporated Cities and County have permit authority for floodplain development. A permit is required to do any of the following in a floodplain: build, rebuild, bring in fill dirt, re-grade the land, excavate, add on to or improve a home or business, place a manufactured or mobile home unit, install an underground or above-ground tank, subdivide land, and place accessory buildings and temporary structures. New and improved buildings and additions, including manufactured homes, must be elevated minimum one foot above the base flood level. Buildings that are damaged more than 50 percent of their market value, regardless of whether the damage is due to flood, fire, wind or other cause - must be made compliant with the County/City's floodplain management requirements. Before the start of any activity that requires a permit, applicants must first consult with the Floodplain Administrator to determine whether a proposed project is in a floodplain. Failure to obtain a permit constitutes a violation of County/City ordinance and individuals are subject to citations, monetary fines, and legal action for their failure to obtain a permit prior to the start of construction or other activity that requires a permit. Elevations of fill pads in subdivisions are inspected and validated as part of the grading inspection. Elevation Certificates are collected before the Certificate of Occupancy (CO) is issued for buildings located within the Special Flood Hazard Area (SFHA).

From a technical perspective, the District has instituted many systems and programs to support mitigation efforts including:

- GIS (see below)
- Early Warning Alert System
- Surveying
- Interactive Maps
- Real Time Data
- User Friendly Website (FAQs)
- Access to Presentations to stakeholders (City of Beaumont, Sierra Club, SETxFCS)



Administrative and Technical Review Recommendation to support District Mitigation Efforts:

Funding to continue training staff on all of the capabilities and to update software.

Regulatory and Planning

As mentioned in the Technical and Administrative section, The District has several plans used for long term planning including:

- 2006 JCDD6 Master Drainage Plan
- 2007 JCDD6 Drainage Criteria Manual
- 2019 Beaumont Master Drainage Plan
- Taylors Bayou Watershed Study
- Flood Protection Planning Study; City of Beaumont and Jefferson County, Texas
- Jefferson County and the City of Beaumont Flood Insurance Study (FIS).

Regulatory and Planning – implementation of ordinances, polices, local laws and state statutes, and plans and programs that relate to the management and governance of growth and development to include:

- Local ordinances, zoning and building codes
- On-going plans or projects

These plans were used to inform the development of this plan update and data, facts and relevant information from each plan was used in the plan update. For instance, information from the 2019 Beaumont Master Drainage Plan led to actions in this plan.

Brief definitions of each plan can be found in Table 2-5.

Table 2-5 - Description of Existing Plans, Jefferson County Drainage District No. 6

Existing Plans, Jefferson County Drainage District No. 6
Name: 2006 Jefferson County DD6 Drainage and Flood Damage Reduction Plan (Master Drainage Plan **Description:** Jefferson County DD6 prepared the Flood Damage Reduction Plan to examine how development is reviewed and to satisfy the requirements of HB 919 so that JCDD6 could develop, adopt, implement, and enforce regulations relating to its review and approval of development proposals. **Relationship to Natural Hazard Mitigation Planning:** JC DD6 meets on an annual basis to review this plan, specifically to select the best way to expand on the District's capability to enforce development restrictions throughout the service area. The District completes periodic reviews of the Master Drainage Plan to identify mitigation actions that can be incorporated in the Hazard Mitigation Plan.
Name: 2007 Drainage Criteria Manual for Drainage District No. 6 **Description:** This manual was completed to support the Master Drainage Plan and Drainage Regulations that were adopted by Jefferson County DD6 pursuant to the authority set forth in the Texas Water Code §49.211. The purpose of the Drainage Criteria Manual is to outline criteria and guidance to be used by developers, engineers, and land surveyors in the design of drainage measures to manage runoff. **Relationship to Natural Hazard Mitigation Planning:** The District completes periodic reviews of the Criteria Manual to identify mitigation actions that can be incorporated in the Hazard Mitigation Plan. JCDD6 meets on an annual basis to review these regulations, specifically to identify ways to expand criteria and guidance to be used by developers, engineers, and land surveyors in the design of drainage measures to manage runoff.

Existing Plans, Jefferson County Drainage District No. 6
Name: Flood Protection Planning Study; City of Beaumont and Jefferson County Texas **Description:** This study focuses on the Hillebrandt Bayou Watershed and shares some of the same actions and potential projects as this Hazard Mitigation Plan. **Relationship to Natural Hazard Mitigation Planning:** Study helped develop mitigation actions.
Name: 2019 Beaumont Master Drainage Plan **Description:** The purpose of the Master Drainage Plan (MDP) is to develop a comprehensive understanding of the City of Beaumont's (City) current drainage infrastructure in order to develop a strategic capital improvement plan (CIP) designed to reduce flooding and obtain recommendation of improvement projects. **Relationship to Natural Hazard Mitigation Planning:** Plan helps identify project and costs for potential CIP and grant funds.
Name: Taylors Bayou Watershed Study **Description:** The proposed regional watershed study will update previous study efforts for Taylor Bayou and Hillebrandt Bayou and will develop a new study for the Pine Island watershed. Pine Island has been the source of major flooding from Polk county to Jefferson County encompassing more than 700 square miles. There has never been a comprehensive flood study of the Pine Island watershed to show its impacts to its regional surroundings. The timeframe for completing the Regional Watershed Plan in 18 months. **Relationship to Natural Hazard Mitigation Planning:** Study will help identify projects to mitigate flooding.
Name: Jefferson County and the City of Beaumont Flood Insurance Study (FIS) **Description:** The most recent FIS's for both the City of Beaumont and Jefferson County are dated August 6, 2002. These studies were reviewed again as part of the Plan update. **Relationship to Natural Hazard Mitigation Planning:** After analysis and evaluation, the goal is to have improvement options that address structural flooding within the watersheds, identify ng projects and prioritization of those projects.

Regulatory Support for Hazard Specific Mitigation – Floods

As mentioned earlier, JCDD6 has no direct responsibility for oversight of development in the floodplain. When development is proposed within the Cities or County, within the floodplain, JCDD6 is asked to review and comment on the subdivision plans. Since 2017, JCDD6 has reviewed approximately 1,582 permits.

The Cities and County have strong development and permitting requirements for development in and out of the floodplain. As mentioned in the last iteration of this plan the City of China passed a permit ordinance, effective April 2016.

Drainage Regulations. The District regulates drainage in close coordination with the County and incorporated Cities. The District published a Drainage Criteria Manual to support the Master Drainage Plan and Drainage Regulations adopted by the District pursuant to the Texas Water Code Section 49.211.

Permits. The District requires a permit for pipeline and utility crossings as well as storm drainpipe tie ins. All information is available on the District's website.

Emergency response is the responsibility of the City of Beaumont and Jefferson County. The City owns and maintains several roadside ditches, however JCDD6 owns the majority of ditches within JCDD6 and is responsible for routine maintenance. After an event, it is a cooperative effort between the City, County Precincts, and JCDD6 to identify ditches that need cleaning (as well as crossings). There are known problem areas that are regularly checked during and after an event.

Both the City and the County have early warning capability. Citizens in the area rely mostly on local weather, which is reported to be very capable. JCDD6 has over 86 stream and rainfall gauges throughout the District. These stream gauges provide data that is used by JCDD6 and the Lake Charles branch of the National Weather Service to predict potential flooding. The District uploads stream gauge data to the National Weather Service every 15 minutes. Further discussion on existing policies and programs are addressed in "review and incorporation of existing plans, studies, reports and technical information".

Financial Resources

The District is considered a special district within Jefferson County who is the taxing authority. The District receives funds from a rate that is annually set by the County from collected taxes. In addition, the District actively pursues grants through various state and federal agencies for projects and programs, including hazard mitigation.

Financial Resources – Financial capabilities - the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions.

Insured City Buildings

The District maintains approximately $6.5 million in property insurance coverage on buildings and facilities it owns, to protect the District from damage due to structural fire, wind and lightning and flooding. The District also carries approximately $23 million in coverage for mobile equipment.

Financial Resources Recommendation to support District Mitigation Efforts: Similar to administrative recommendation, training dedicated to finding and understanding all types of grant funds (federal and state) could be helpful for the District to fund mitigation projects through means other than taxes and fees.

Education and Outreach

The District has recently updated its website to be a user-friendly site to find out current information on projects from consideration and design to construction and completion, permitting information, early warning system gauge information, interactive mapping as well as general information about the District. It actively

Education and Outreach –refers to education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information

communicates with its residents using a variety of media, each of which have been used to convey information, including content about hazards including:

- News Releases - News releases announcing District events and issues of public interest are sent to local media help publicize information to the public.
- Website - The District's official website provides information, applications, forms, and interactive features such as maps.
- Special Events – Presentations given to all interested parties (Cities, private-nonprofits, civic groups as examples)
- Other Services include print pieces such as brochures, articles (see Figure H), signage, and incorporating information into other jurisdiction's awareness campaigns.
- Engineering department answers all of the resident's inquiries related to drainage, floodplain, and FEMA FIRMs.
- GIS provides for interactive mapping features to allow user to map based on individual query.

Figure H - Example of a District Article on Grant support of JCDD6 Drainage Projects

State, federal grants fund local drainage projects

Jefferson County Drainage District No. 6 (DD6) is utilizing millions of dollars in federal and state grants to fund numerous drainage projects throughout their jurisdiction in Southeast Texas.

At a board meeting Oct. 13, DD6 General Manager Dr. Joe Majdalani and others on the DD6 team outlined several grant-funded projects, discussed new drainage and flood mitigation grant applications in the works and broke down the many maintenance tasks the district performs throughout the area.

Since 2003, the district has successfully been awarded federal grants for 50 projects totaling over $134,600,000, reports District Engineer Doug Canant, and is currently taking steps to mitigate the threat of flooding due to severe weather after the devastation of Hurricane Harvey and Tropical Storm Imelda.

"The district has filed and is filing state and federal grants to fund future significant drainage projects," said Canant. "The district has recently been awarded $17 million to fund more drainage projects. An additional $4 million was recently awarded to Jefferson County to be used for Drainage District No. 6 drainage projects. There is an additional $370,000,000 in flood improvement projects that the district will be filing grant applications for this month.

"These grants enable the district to do large drainage projects without raising taxes. In fact, this is only an example of the most immediate capital projects to be funded through state and federal grant funds. The district will continue to utilize all available state and federal funds to supplement its tax revenue to allow the district to achieve these necessary drainage projects that will minimize the risk of flooding in our community."

DD6 Project Manager Nelson Nixon said his maintenance crews diligently perform their scheduled tasks and, in some areas, are exceeding annual mowing expectations. Among other duties with which his staff is charged, the maintenance crew must often pursue right-of-way permissions to maintain ditches and other features on private properties. In spite of the challenges, Nixon said his crew is up to the task.

"Our systematic approach to the district's Channel Maintenance Program is working well," Nixon described. "We are starting to see the benefits. In fact, during the most recent rain events that have occurred, the system performed very well. I am proud to say, at this time, we have no outstanding complaints from citizens regarding maintenance concerns of the district's facilities."

Nixon said the district recently acquired a new piece of equipment that allows the team to mow in areas previously inaccessible, like old lake beds too muddy to drive through with normal lawn tractors or other vehicles. The Marsh Master Amphibious Marsh Buggy is light enough to travel on swampy terrain that would bog down heavier machines, explained Nixon.

Marsh Master

Dr. Majdalani said he is committed to improving the infrastructure in the district and to providing the DD6 team the means to get the job done, including seeking out and applying for the additional funding that allows for many vital Southeast Texas projects.

"It is my job to provide the tools and vision to the district board of directors and employees to best reduce the risk of flooding in our community. My approach is to study the district's needs, design and plan an approach, assist in the execution of the projects needed by the district and follow up by measuring the efficiency of the district's work. It is my goal to always approach the district's needs with the most timely and cost-effective measures."

To learn more about DD6 and the services they provide the public, visit the website at www.dd6.org.

– Sharon Brooks

6 | Business Journal • November 2020

Education and Outreach Recommendation to support Mitigation Efforts: Support an awareness campaign about the District's work.

Participation in National Flood Insurance Program (NFIP) and Community Rating System (CRS)

Participation in the National Flood Insurance Program (NFIP) is important to JCDD6 and its residents. This is evidenced by the Cities in the planning area, and the County's commitment to regulating development and redevelopment, by adoption of provisions that exceed the minimum requirements, and by its active pursuit of mitigation opportunities. The Cities and Jefferson County, with support from JCDD6, are firmly committed to continued compliance with the NFIP. It is important to note that JCDD6 cannot participate in the NFIP as Cities and Counties do. It cannot not apply for NFIP (Cities and County do) or CRS (Cities and County do) status.

However, it supports the communities within its planning area in any way it can to keep its standing in the NFIP and CRS.

JCDD6 is a conservation and reclamation district and a political subdivision of the State of Texas. Considering JCDD6 is a separate entity and does not directly participate in the NFIP, specific actions will be determined by representatives and officials with the incorporated areas and Jefferson County within JCDD6. With this in mind, JCDD6 did not identify and prioritize NFIP actions as part of the planning process. DD6 will continue to work closely with the cities and Jefferson County to identify and recommend actions that will ensure continued compliance with the NFIP.

The City of Beaumont satisfied requirements for initial participation in the NFIP and joined the Emergency Program and ultimately the regular program in 1970. The City of China satisfied requirements for initial participation in the NFIP and joined the Emergency Program and ultimately the regular program in 2008. The City of Bevil Oaks satisfied requirements for initial participation in the NFIP and joined the Emergency Program and ultimately the regular program in 1983. The City of Nome satisfied requirements for initial participation in the NFIP and joined the Emergency Program and ultimately the regular program in 1990.

Jefferson County satisfied requirements for initial participation in the NFIP and joined the Emergency Program. Upon issuance and final approval of the Flood Insurance Rate Map in June of 1983, the County joined the Regular Program. The effective Flood Insurance Rate Map for the County has been revised a number of times to reflect more detailed information and changes to the floodplain and is now used as the minimum flood hazard area within which development must conform to floodplain management regulations.

As mentioned at the beginning of this Section, JCDD6 is a conservation and reclamation district and a political subdivision of the State of Texas. Considering JCDD6 is a separate entity and does not directly participate in the NFIP, specific actions will be determined by representatives and officials within the incorporated areas Jefferson County and the County. With this in mind, the District did not identify and prioritize NFIP actions as part of the planning process. It will continue to work closely with the Cities and County to identify and recommend actions that will ensure continued compliance with the NFIP.

Tropical Storm Harvey and Aftermath
As a result of Hurricane Harvey in 2017, the District sustained damages to four (4) District owned vehicles, equipment and a conex box (storage) with supplies stored at a worksite. In addition, over 4,500 homes sustained flood damage in the JCDD6 area.

Tropical Storm Imelda and Aftermath
In 2019, Tropical Storm Imelda brought over 30 inches of rain in a twelve-hour period to Jefferson County. Over 5,100 homes were flooded.

Capabilities to Support Natural Resources
The District values open space and encourages protection of trees and wetlands in its development processes. The approval process for subdivisions within the County and Cities requires developers to delineate waterways, drainage structures, the boundaries of flood-prone areas (including floodways). As a Conservation and Reclamation District, the jurisdictional authority was expanded to include, among other things, eminent domain. The Texas Legislature ruled that the powers granted under House Bill No. 1063 were an urgent necessity for effective drainage throughout the District. It was further detailed that the creation of the Conservation and Reclamation District would result in the conservation of the natural resources of the state and eliminate health and safety hazards.

Accordingly, the continuing mission of Jefferson County Drainage District No. 6 is to:

Provide flood damage reduction projects that work, with appropriate regard for community and natural values.

SECTION 3 – HAZARD IDENTIFICATION AND RISK ASSESSMENT

Introduction

Risk assessments are conducted to determine the potential impacts of specified hazards on human safety, the planning area economy, and both the developed and natural environments of the community. Risk, as viewed from a hazard mitigation perspective, is the potential for loss of life, personal injury, property damage, loss or other impacts created by the interaction of natural hazards with local citizens and community assets and include natural processes, such as tornadoes. FEMA has provided a diagram (Figure I) that helps best illustrate the concept of risk as the overlap between hazards and community assets – the smaller the overlap, the lower the risk. This plan update focuses on how risk has changed since the current plan was completed including changes related to land use development, and integrates updated hazard information. Each hazard includes a description of the location, extent, previous occurrence and probability of future events as well as events that occurred since the 2016 plan. Hazards are then evaluated on the basis of potential impact on the community, the community's overall vulnerability and the most significant risks.

Changes from the Last Plan

The last iteration of the plan, the District, which has limited to no authority to mitigate against most hazards as the Cities and County are responsible, omitted hazards based on that rationale and focused on all potential hazards that may affect Jefferson County Drainage District No. 6 boundaries for which it has authority (e.g. floods, tropical storms) and only profiled hazards that could impact District facilities (tornadoes and wind). However, as part of this update process, the MPC reviewed all hazards that impact the jurisdictional area and if they have fully mitigated the hazard (e.g., lightning) or is negligible to non-existent in the area (e.g., earthquakes), those hazards would not include profiles or actions. The MPC reviewed the hazards that were included as part of the 2017 plan and determined that the following hazards would be addressed in the plan update. The hazards are floods, dam failure, tornadoes, severe thunderstorms – high wind, hurricanes and tropical storms, drought (which includes extreme heat), and severe winter weather/winter storms. Numerous changes from the previous version of the plan were incorporated, including updated maps and tables displaying the event history from the National Center for Environmental Information (NCEI) for various hazards, as well as many other less significant modifications.

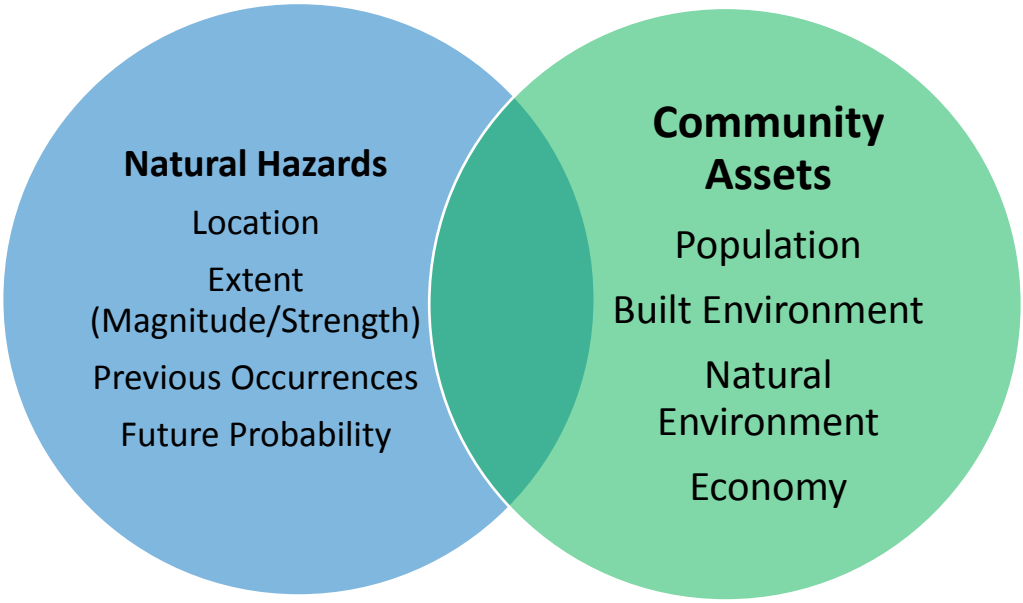
After reviewing all hazards that could potentially impact JCDD6, the MPC considered the flood hazard the most significant. The hazards reviewed are found in Table 3-1 and provide a brief explanation if the hazard would be further profiled and actions warranted in the 2022 update:

Table 3-1 – JCDD6 2017 Hazards and 2022 Hazards

Hazard List	2017 JCDD6 Plan Hazards	2022 JCDD6 Plan Update
Avalanche	N/A	Does not occur in area
Tsunami	N/A	Does not occur in area
Wildfire	Omitted	Does not occur in area
Earthquake	Omitted	Does not occur in area

Hazard List	2017 JCDD6 Plan Hazards	2022 JCDD6 Plan Update
Subsidence	Omitted	Does not occur in area
Landslide	Omitted	Does not occur in area
Expansive Soils	Omitted	Does not occur in area
Erosion	Omitted	Fully Mitigated
Hail	Omitted	Fully Mitigated
Extreme Cold	Did not discuss	Fully Mitigated
Lightning	Omitted	Fully Mitigated
Extreme Heat	Omitted	Combining Extreme Heat with Drought
Drought	Omitted	Combining Extreme Heat with Drought
Flood	Flood	Flood
Hurricane	Hurricane/Tropical Storms	Hurricane/Tropical Storm
Storm Surge	Discussed as part of H/TS	Include in H/TS
Dam Failure	Omitted	Dam Failure
Tornado	Tornado	Tornado
Severe Thunderstorms/Wind	Severe Thunderstorms/Wind	Severe Thunderstorms/Wind
Severe Winter Weather/Winter Storm	Omitted	Severe Winter Weather/Winter Storm

Figure I FEMA Concept of Risk Diagram



Overview of Risks

Table 3-2 identifies the total number and estimated value of buildings/infrastructure within Jefferson County Drainage District No. 6 as reported by the Jefferson County Central Appraisal District. The table indicates there are 44,303 residential buildings (single-43,602 and multi-

family-701), 3,688 commercial buildings and 2,053 infrastructure and utility buildings including oil and gas, electric, telephone, railroad, etc. in the District. While buildings are important and tangible to estimate value, human life is more complex. The potential annual losses from deaths and injuries are calculated by using the values in the current FEMA BCA guidance which is $5.8 million for deaths and $90,000 for treat and release injuries. This information and the data in Table 3-4 is used periodically throughout this plan update to identify the overall exposure within JCDD6 for certain hazards that equally impact the entire planning area such as drought and hurricanes/tropical storms.

Table 3-2 – Jefferson County Drainage District No. 6 Planning Area Structures (2021 Certified Total for 849 Drainage District No. 6), 9-16-21

Type	No. of Structures
Single Family Residences	43,602
Multi Family Residences	701
Commercial Buildings/Industrial	3,688
Infrastructure and Utility Buildings	2,053
JCDD6 Owned Buildings*	7
District Owned other facilities*	8

* Non-four wall infrastructure that is insured.

Damage and losses (including physical damage, indirect and economic losses, and personal injuries and fatalities) that are associated with hazards result when an event affects areas where people and improved property are located. After hazards are identified, estimates of risk exposure for people and property (measure of "at-risk") can be prepared.

When the full range of potential natural hazards are reviewed, it becomes apparent that some events occur frequently, and some are relatively rare. Some hazards impact large numbers of people to a limited degree, while others may cause very localized but significant damage. As described in the flood hazard profile, floods have historically caused the most property damage in JCDD6.

Hazards Omitted

The District focused on hazards that occur within the planning area that historically have had enough impact (e.g., damage to property, infrastructure, injury or death) that mitigation of that hazard is necessary for the welfare of the community. Certain hazards have no history of impact in the planning area; therefore, the District has decided to omit these hazards. Important to note, while the District believes these hazards are negligible, each year it will review the hazard during its annual review to determine if the impact has changed and if so, will update the plan accordingly. Table 3-3 provides a brief explanation on each hazard that the District considered negligible impact and therefore not profile and is omitted from further discussion in this the plan update.

Table 3-3 JCDD6 Omitted Hazards

Hazard Considered	Review	Reason for Omission
Avalanche	Omit	Does not occur in the area
Earthquakes	Omit	Does not occur in the area. According to the State Plan, an earthquake occurrence for the planning area is considered exceedingly rare. There is no history of impact to critical structures, systems, populations or other community assets or vital services as a result of earthquakes and none is expected in the future.
Erosion	Omit	FULLY MITIGATED. While the hazard does occur, the District provides erosion control measures at all projects through stabilization and seeding and performs regular maintenance for District ditches, channels and waterways. For these reasons, the hazard is considered fully mitigated.
Expansive Soils	Omit	Does not occur in the area. There is no history of impact to critical structures, systems, populations or other community assets or vital services as a result of expansive soils and none is expected in the future.
Extreme Cold	Omit	FULLY MITIGATED. Jefferson County Drainage District No. 6 does have, albeit rarely, extreme cold occurrences, but when extreme cold does take place, the District facilities have been built to withstand. All pipes are insulated, the District has backup generators for downed power lines and has the necessary equipment to remove ice and snow. In addition, for the area, extreme cold is usually part of a bigger winter storm event and so the District will profile that hazard.
Extreme Heat	Include as part of drought	While extreme heat does occur in the area, the District included extreme heat with the drought profile so actions to mitigate extreme heat and drought will be considered as one hazard.
Hail	Omit	FULLY MITIGATED. While this hazard does occur in the area, JCDD6 buildings are built to withstand hail damage and the District has covered parking garages and storage areas to protect all assets from hail damage and therefore is considered fully mitigated.
Landslide	Omit	Does not occur in area. Given that there are no recorded landslides in JCDD6 and the USGS indicates there is less than 1.5% chance the area will be involved in a landslide, there is less than 1% chance of a future occurrence making future

Hazard Considered	Review	Reason for Omission
		occurrence very rare. Therefore, the hazard is negligible and will not be profiled.
Lightning	Omit	FULLY MITIGATED. Jefferson County Drainage District No. 6 does have lightning occurrences, but when lightning does happen, the District is protected to the best of their abilities. The District has lightning protection devices on critical facilities, lightning rods and grounding on communication buildings and surge protection on all buildings and therefore is considered fully mitigated.
Subsidence	Omit	Does not occur in area.
Tsunami	Omit	Does not occur in area.
Wildfire	Omit	Does not occur in area. There is no history of impact to critical structures, systems, populations or other community assets or vital services as a result of wildfires within the District and future occurrences are expected to be extremely low to negligible.

Hazards Included

Through the profile process, for the hazards that affect the hazard area, the NCEI database indicates that, as of 7/31/2021, historically these hazard events caused a combined total of approximately $5.553 billion in property damage in Jefferson County. The database also indicates that there have been 191 personal injuries and 18 fatalities as a result of these events (see Table 3-4). Using the FEMA BCA guidance, the estimated loss for those fatalities is approximately $104.4 million; not including personal injury and lost time costs, which would increase costs. It is important to note that these numbers are for the entire County, not just the District, but it is consistent with the hazards that Jefferson County Drainage District No. 6 considers likely and impactful.

Table 3-4 Jefferson County Injuries, Deaths and Damaged from Natural Hazards (Source: NOAA/NCEI)

Injuries from 1950-2016	189
Injuries from 2017-2021	2
Total Injuries	191
Death from 1950-2015	8
Deaths from 2017-2021	10
Total Deaths	18
Property Damages from 1950-2016	$1.975 B
Property Damages from 2017-2021	$3.578 B
Total Property Damages	$5.553 B

The Hazard Summary information below is what the District used when reviewing each hazard and provides an overview of the likelihood of occurrence and the estimated impact to public health, safety, and property for the hazards included in this plan update. The categories below were reviewed for each hazard profiled and summarized in Table 3-5.

HAZARD SUMMARY

Location (Geographic Area Affected)

- Negligible: Less than 10 percent of planning area or isolated single-point occurrences
- Limited: 10 to 25 percent of the planning area or limited single-point occurrences
- Significant: 25 to 75 percent of planning area or frequent single-point occurrences
- Extensive: 75 to 100 percent of planning area or consistent single-point occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)

- Weak: Limited classification on scientific scale, slow speed of onset or short duration of event, resulting in little to no damage
- Moderate: Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, resulting in some damage and loss of services for days
- Severe: Severe classification on scientific scale, fast speed of onset or long duration of event, resulting in devastating damage and loss of services for weeks or months
- Extreme: Extreme classification on scientific scale, immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions

Probability of Future Events

- Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
- Occasional: 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than1 year.

Overall Significance/Vulnerability

- Low: Two or more criteria fall in lower classifications, or the event has a minimal impact on the planning area. This rating is sometimes used for hazards with a minimal or unknown record of occurrences or for hazards with minimal mitigation potential.
- Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometimes used for hazards with a high extent rating but very low probability rating.
- High: The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

Table 3-5 Hazard Summary

Hazard Type	Location	Maximum Probable Event	Likelihood of Occurrence	Vulnerability
Drought/Extreme Heat	Extensive	Moderate	Likely	Low
Flooding	Extensive	Extreme	Highly Likely	High
Hurricane/Tropical Storm	Extensive	Extreme	Highly Likely	High
Thunderstorm and High Wind	Extensive	Extreme	Highly Likely	High
Tornado	Limited	Severe	Likely	High
Severe Winter Weather/Winter Storm	Significant	Moderate	Likely	Low
Dam Failure	Limited	Severe	Unlikely	High

Numerous federal agencies maintain a variety of records regarding losses associated with natural hazards. Unfortunately, no single source is considered to offer a definitive accounting of all losses. FEMA maintains records on federal expenditures associated with declared major disasters. The U.S. Army Corps of Engineers (USACE) and the Natural Resources Conservation Service (NRCS) collect data on losses during the course of some of their ongoing projects and studies. As mentioned earlier in this Section, the National Oceanic Atmospheric Administration's (NOAA) National Center for Environmental Information database is another source where data statistics such as injuries, deaths, and damage estimates are maintained for a variety of natural hazards. The data is maintained at the county level, with more recent entries listing the specific location within the county. Although not always specific to the District, this county-wide hazard data from the NCEI is often the best available resource for documenting historical events.

In the absence of definitive data on some of the natural hazards that may occur in the District, illustrative examples are useful. Table 3-6 provides brief descriptions of particularly significant natural hazard events occurring in the District's recent history.

Both the City of Beaumont and Jefferson County have early warning capability. Citizens in the area rely mostly on local weather, which is reported to be very capable. JCDD6 has over 86 stream and rainfall gauges throughout JCDD6. These stream gauges provide data that is used by JCDD6, its communities and the Lake Charles branch of the National Weather Service to predict potential flooding. JCDD6 uploads stream gauge data to the National Weather Service every 15 minutes.

Data on Presidential Disaster Declarations characterize some natural disasters that have affected the area. In 1965, the federal government began to maintain records of events determined to be significant enough to warrant declaration of a major disaster by the President of the United States. Presidential Disaster Declarations (DRs) are made at the county level and are not specific to any one city. It should be noted that not all disaster declarations for Jefferson County affected Jefferson County Drainage District No. 6. However, as of 2021, 22 such disasters had been

declared in Jefferson County and are identified as part of the summary in Table 3-6 below including three since the last plan update. Declared disasters as well as other significant disasters that directly affected JCDD6 are noted.

Table 3-6 Natural Hazard Events and Declared Major Disasters in Jefferson County (Sources: FEMA, NCEI database)

Date & Disaster (DR)	Nature of Event
November 7, 1957	TORNADO (F3) – An F3 tornado touched down in Jefferson County. This tornado was 200 yards wide and stayed on the ground for 4 miles causing $2.5M in damages, 2 deaths, and 59 injuries.
June 29, 1973 (DR-393)	SEVERE STORMS AND FLOODING – a massive storm hit the Houston Texas area dumping 10 – 15 inches of rain. In total the storm resulted in 10 deaths and over $50M in damage.
April 26, 1979 (DR-580)	SEVERE STORMS, TORNADOES, AND FLOODING – (Nearly 300 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $2.8 M in payments). Rainfall reported in amounts between 9.56 to 10.7 inches in the Beaumont area and 11.5 inches in Bevil Oaks flooded many communities along the Neches river and Taylor, Pine Island, and Hillebrandt Bayous. Pine Island crested at 34.29 feet at Sour Lake, surpassing a record 31 feet set in 1917. Many homes, businesses and roads in the area were damaged.
July 28, 1979 (DR-595)	STORMS AND FLASH FLOODS - (Over 100 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $700K in payments). Tropical Storm Claudette formed in the Central Atlantic the morning of July 15, 1979. It never reached hurricane intensity as it wandered across the northern Caribbean, and the Gulf of Mexico 10 days, making landfall near Port Arthur the evening of the 24th. Rainfall was estimated at 11 inches in the Beaumont area. The area suffered severe wind damage to utilities.
September 26, 1980 (DR-632)	TROPICAL STORM DANIELLE - (Over 200 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $1.5M in payments). Rains of 8-9 inches fell on most of Texas. Particularly hard hit were Fisher, Mitchell, Nolan, and Scurry Counties.
May 31, 1989 (DR-828)	SEVERE STORMS, TORNADOES AND FLOODING - (28 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $500K in payments). Widespread rains caused flooding that resulted in five deaths and total damages of about $50 million. The storm dumped between 10 and 15 inches of rain in the southeast Texas area. Homes in Bevil Oaks flooded.

Date & Disaster (DR)	Nature of Event
July 18, 1989 (DR-836)	TROPICAL STORM ALLISON - (Over 400 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $3.8M in payments). Tropical Storm Allison caused torrential rains of 10-15 inches from Houston to Beaumont. Houston Intercontinental Airport recorded 10.34 inches during 24 hours. The storm resulted in three deaths and over $60M in damages.
November 15, 1994 (DR-1041)	SEVERE THUNDERSTORMS AND FLOODING - (Over 200 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $5.5M in payments). A tropical, mid-latitude rainfall of unusual proportion on a 30- to 35-county area of southeast Texas resulted in catastrophic flooding. The intense rainfalls totaled more than 25 inches at several locations and more than 8 in. on much of southeast Texas. The storm resulted in 18 deaths and an estimated $700M in damages.
May, 1996	DROUGHT - Drought conditions continued across southeast Texas. Rainfall totals from January through May averaged 10 to 15 inches below normal. The main areas affected included farming and fire protection. Crop damage across the entire region exceeded $1 million dollars.
August 12, 1996	SEVERE LIGHTNING - As many as 9,000 lightning strikes this evening resulted in one man injured, one house fire, and several telephone poles damaged.
January 14, 1997	ICE STORM - A record ice storm paralyzed southeast Texas and southwest Louisiana. Around 90,000 electric customers across southeast Texas were without power for up to six days. Emergency shelters were opened for several nights due to the cold weather following the ice storm. More trees and power lines were knocked down in this ice storm than what came down during Hurricane Bonnie in 1986. Hundreds of homes received minor damage due to trees or tree limbs falling on roofs. Several house fires were directly or indirectly related to the ice storm, but fortunately there were no major injuries from the house fires. Numerous traffic accidents attributed to icy roads led to several minor injuries. One death was indirectly attributed to the ice storm. Two men were electrocuted on Tuesday, January 21st, while doing cleanup work for a local electric company. One 48-year-old man died, and a 19-year-old man was seriously injured in the accident
August 26, 1998 (DR-1239)	TROPICAL STORM CHARLEY – (Limited damage in Jefferson County) Up to 16 inches of rainfall in south-central Texas caused flooding in many counties, to include Jefferson County.
October 14 1998 (DR-1245 & 1257)	HURRICANE GEORGES - (23 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $200K in payments). TROPICAL STORM FRANCIS and a localized thunderstorm that followed later in the same month, resulted in widespread flooding.

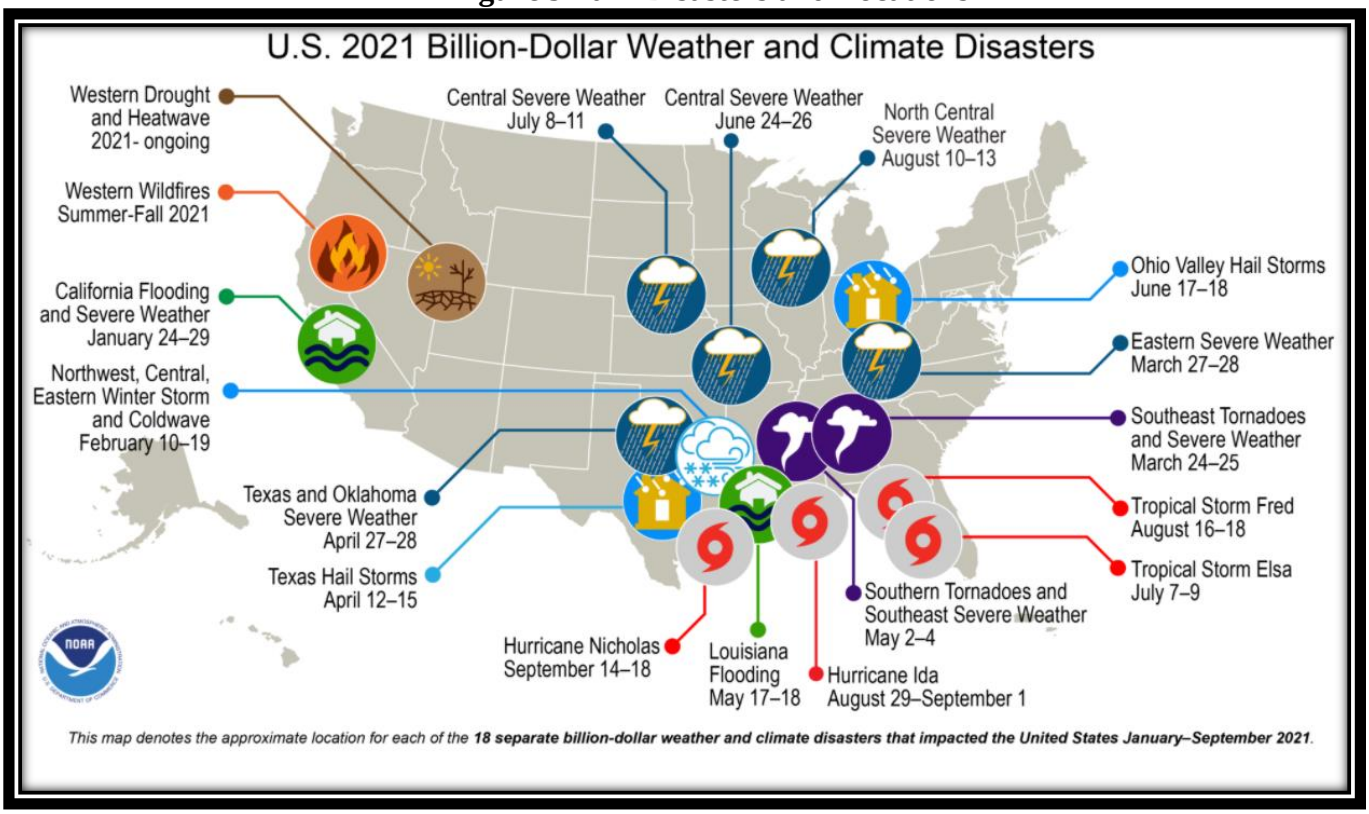
Date & Disaster (DR)	Nature of Event
August 31, 2000	EXTREME HEAT - Record heat occurred in late August across southeast Texas. At the Southeast Texas Regional Airport, the all-time record high of 108 was tied on August 31st. Previously it had been achieved on July 14, 1902.
June 9, 2001 (DR-1379)	TROPICAL STORM ALLISON - (Nearly 500 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $12 M in payments). Tropical Storm Allison produced flooding throughout Southeast Texas, Louisiana, and across the eastern United States. Damages were estimated at $5 Billion and prompted a Presidential disaster declaration for 30 counties in Texas.
October 29, 2002 (DR-1439)	SEVERE STORMS, TORNADOES AND FLOODING – (Over 400 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $8.7M in payments). This unnamed storm produced heavy rains, causing flooding throughout Jefferson County.
September 24, 2005 (DR-1606)	HURRICANE RITA – Hurricane Rita made landfall just east of the Texas-Louisiana border. Along the coast of Jefferson County, storm surges near 10 feet occurred near Sabine Pass, where over 90 percent of the homes were severely damaged or destroyed. The storm surge backed up the Sabine River and flooded a small section of downtown Orange with around four to five feet of storm surge. High winds estimated at over 100 mph snapped and uprooting trees, and damaged over 125,000 homes and businesses.
September 13, 2008 (DR-1791)	HURRICANE IKE - Ike delivered a 17.5-foot storm surge on Jefferson County's coastal plain and dropped anywhere from 6 to 20 inches of rain, depending on where in the County it was measured. The surge caused flooding in the county's sparsely developed coastal areas, though no flooding occurred as a result of heavy rain. In total, at least 4,000 homes were flooded in Jefferson County. Within JCDD6, the event caused no flood related property damages, mainly due to recently completed mitigation efforts.
August 25, 2017 (DR – 4332)	TROPICAL STORM HARVEY - Widespread and long duration rainfall produced a storm total rainfall over 40 inches across a large portion of the county. The highest rainfall totals in Jefferson County were 60.58 inches 1.5 mile southwest of Nederland and 60.54 inches 1.3 mile north of Groves. This resulted in over 64,000 homes being flooded. The hardest hit areas were Port Arthur, Groves, Bevil Oaks, Hamshire, Fannett, China, and northeast Beaumont. Several refineries in the County also received floodwaters and were offline for an extended period. City and county infrastructure was also damaged with water pumps and treatment plants being inundated. Record crests were observed along Pine Island and the lower Neches. 5 deaths were reported by flooding.

Date & Disaster (DR)	Nature of Event
October 4, 2019 (DR – 4466)	TROPICAL STORM IMELDA - The remnants of Imelda drifted slowly across the interior sections of Southeast Texas during the 18th. A very heavy band of rain dumped over 30 inches of rain in a 12-hour period which created extensive flooding across Jefferson County. The maximum storm total was 44.29 inches near Fannett. The first report of flooding was from the Jefferson County Sheriff's Department with major street flooding in the city of Beaumont and water was entering several homes. Due to the intense rate at which the rain fell flooding depth was worse than Harvey at some locations. Over 5,100 homes were flooded. Numerous high-water rescues were conducted throughout the County. Three people drowned in Jefferson County during the event, 2 men ran off the roadway and into a ditch in different events. Per a family press release, the other man was struck by lightning, but fell in the flood waters and drowned while attempting to save a horse. Drowning was considered the primary cause of death.
August 26, 2020 (DR 4572)	HURRICANE LAURA - Mandatory evacuation. Storm surge flooded Sabine Pass and backed up area waterways including the Neches River, Hillebrandt Bayou, and Taylor Bayou. Numerous trees and power lines blown down across Port Arthur, Port Neches, Beaumont, Nederland, and Groves. Homes and businesses were damaged by the fallen trees, lines, and poles. Over 60 percent of the County was without power during the peak of the storm. Five people died (indirect deaths) from carbon monoxide poisoning including three in Port Arthur from a generator running in an enclosed area. Another 18 persons were injured and treated for carbon monoxide poisoning (indirect injuries). Wind gusts ranged from 55 to 90 mph across the county. Storm surge reached 3.97 MHHW at Texas Point near Sabine Pass.
February 11-19, 2021 (DR 4582)	The first in a series of Arctic Cold Fronts arrived during the 12th pushing tide levels down along the coast, however the subfreezing temperatures and winter weather did not arrive until the 14th. The event on the 14th began at many places as a light glaze of freezing rain, but quickly changed over to sleet or snow. Another round of winter weather occurred on the 17th; however this round was mainly freezing rain. The long duration event set many records in the area and rivaled the historic freezes of the region. The event was likely the longest and coldest since December 1989. Interior sections of Southeast Texas saw lows in the single digits and mid-teens were recorded at the coast during the coldest night. Freezing rain moved into the region during the early morning of the 17th. Ice accumulations of up to one tenth of an inch occurred coating the already in place sleet and snow from the event just 2 days prior. This also created more hazardous driving conditions.

Losses Due to Major Disasters

The U.S. has sustained 308 weather and climate-related disasters since 1980. Although no definitive record exists of all public and private losses due to disasters in JCDD6, estimates of the total public and private costs of natural hazards throughout the U.S. where overall damages/costs reached or exceeded $1 billion (including CPI adjustment to 2021) is available. The total cost of these 308 events exceeds $2.085 trillion. In 2021 (as of October 8), there have been 18 weather/climate disaster events with losses exceeding $1 billion each to affect the United States. These events included 1 drought event, 2 flooding events, 9 severe storm events, 4 tropical cyclone events, 1 wildfire event, and 1 winter storm event. Overall, these events resulted in the deaths of 538 people and had significant economic effects on the areas impacted. The 1980–2020 annual average is 7.1 events (CPI-adjusted); the annual average for the most recent 5 years (2016–2020) is 16.2 events (CPI-adjusted). The illustration (Figure J) below depicts the timing and location of these disasters.

Figure J 2021 Disasters and Locations



In most declared major disasters, the federal government reimburses at least 75% of the eligible costs of cleanup and recovery and possibly more depending on the severity of the disaster. The remaining percentage is covered by the state and affected local jurisdictions.

Jefferson County Drainage District No. 6 has experienced numerous disasters and has actively applied for and administered various grants over the years. Table 3-7 is a list of grants that the District has been awarded since the last version of the Plan:

Table 3-7 JCDD6 Grants Since 2017

Grant	Grant Number/Year/Description	Project	Grant Award
HMGP	DR 4332 Hurricane Harvey 2017	China D609 Phase I Drainage Relief	$ 125,026.00
HMGP	DR 4332 Hurricane Harvey 2017	China D609 Phase II Drainage Relief	$ 6,490,517.34
FMA	2018	Mclean Street Relief Project	$ 4,040,580.00
FMA	2018	Amelia Cutoff Diversion/Detention	$ 4,246,000.00
FMA	2018	Elinor Street Drainage Project	$1,493,200.00
FMA	2018	Byrd Gully Relief Project	$711,800.00
TWDB	Flood Protection Grant 2018	Flood Early Warning Alert System	$145,389.00
FMA	*2020*	*Southern Nome Community Flood Control Relief Project*	*$2,286,770.00*
FMA	*2020*	*Ditch 505 Community Flood Control Detention Project*	*$13,517,678.00*
FMA	*2020*	*Ditch 600 Community Flood Control East China*	*$2,853,160.00*
FIF	*2021*	*Regional Watershed Study*	*$8,500,000.00*

Newly awarded grants since the last version of the Plan include (last three in italics have been identified for further review as of drafting of this update):

Dam Failure
UPDATE FROM LAST PLAN

- The hazard is included in this iteration.
- The US Army Corp of Engineers (USACE) maintains a National Inventory of Dams (NID) that provides public statements concerning risk for dams. The two dams upstream from the District, Sam Rayburn and Town Bluff statements can be found in Appendix I. In addition to the information in Appendix I, the NID website has more information available on these and other dams, https://nid.usace.army.mil/ords/f?p=105:22:11169639962117::NO

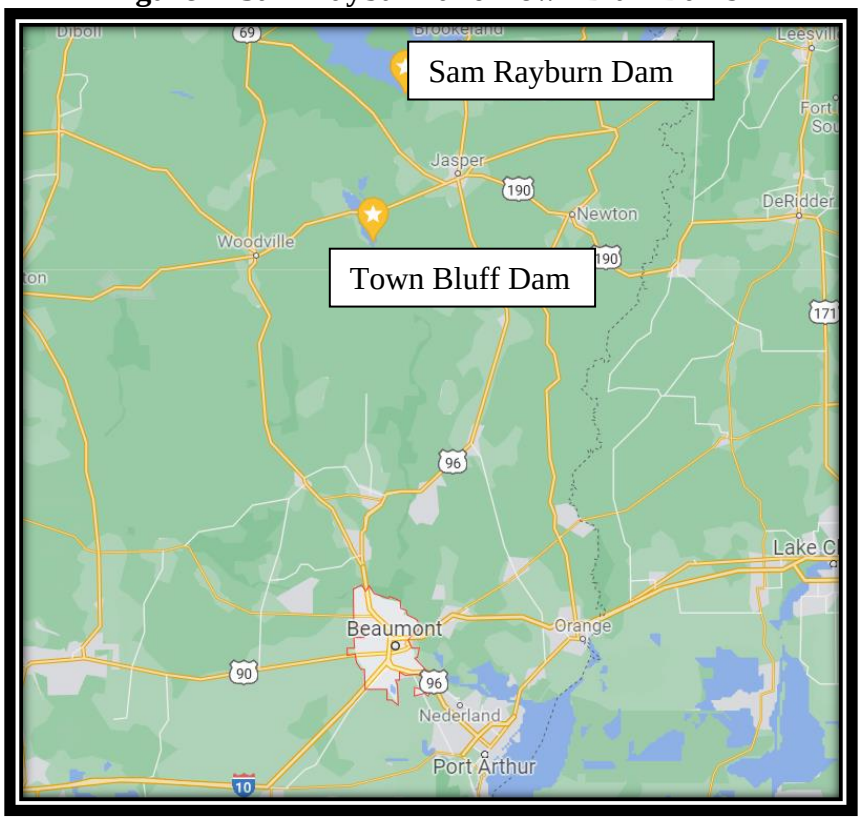
Hazard Description

A dam failure is defined as systematic failure of a dam structure resulting in the uncontrolled release of water, often resulting in floods that could exceed the 100-year flood plain boundaries. A dam failure could cause mass fatalities and extensive structural damage if populated and/or industrial areas are located near or downstream of the dam structure.

Dam Locations

There are two dams that are upstream of the planning area (see Figure K), the Sam Rayburn Dam and the Town Bluff Dam, which if failed, would flow down the Neches River along the east boundary of JCDD6 and the City of Beaumont. These dams create Sam Rayburn Lake and Steinhagen Lake which are upstream from JCDD6. Below are the two dams in relation to the City of Beaumont. The geographic area affected by dam failure is considered limited.

Figure K Sam Rayburn and Town Bluff Dams



Previous Occurrences of Dam Failure
There are no recorded events or damages as a result of a breach or failure in the dams in the planning area to date.

Dam Failure Future Occurrence
Although Sam Rayburn Dam and the Town Bluff Dam reduce the risk of flooding to downstream communities, these dams do not eliminate the risk of flooding. The most likely scenario that could result in downstream flooding are high volume releases from Sam Rayburn Dam through the outlet works and uncontrolled spillway during high water events. These surcharge operational releases occur when the reservoir's flood storage capacity is exceeded and excess water flows through the spillway. Sam Rayburn Dam is designed to reduce the peak flooding levels downstream without risking the structural integrity of the dam. High volume releases from the Sam Rayburn Dam would result in high flows from the Town Bluff Dam. The probability of a future event is considered unlikely.

Magnitude/Extent of Dam Failure
The Sam Rayburn Reservoir and Dam encompasses 112,590 surface acres and contains nearly 2,900,000 acre-feet of water and operates in conjunction with the Town Bluff Dam to provide flood control to the Angelina and Neches River Basin System. Since both projects went into operation, they have reduced damage caused by downstream flooding by more than an estimated $2.3 Billion.

USACE completed a risk assessment in November 2016 and classified the risk associated with Sam Rayburn Dam as moderate. This risk classification is primarily driven by the very low probability for dam failure and the number of large populations at risk below Sam Rayburn Dam. The potential for breach of Sam Rayburn Dam was assessed to be related to three primary risks associated with earthen embankment dams: 1) During an extreme flood event, erosion may occur at the left abutment leading to eventual breach of the dam, 2) Erosion may occur through the foundation near the old river channel leading to eventual breach of the dam, and 3) Erosion along the interface of the powerhouse facility and main embankment during high reservoir elevations could lead to eventual breach of the dam. In the remote event of a dam breach the largest impacts would be to the cities of Evadale, Beaumont, and Nederland, Texas.

The maximum probable extent is considered severe.

Dam Failure Impact
In terms of loss of life and property to residents located close to dams, the area downstream at a lower elevated is most affected. It is assumed that dam breaks happen at a time of maximum capacity and the location of the release water would inundate a downstream area proportional to the maximum capacity of the dam.

Dam Failure Vulnerability
There are approximately 25,000 people living and working in the area that would be impacted if this portion of the floodwall fails during a major storm including a large portion of Port Arthur

and smaller portions of Groves, Port Neches and Nederland. Damaged buildings, downed utilities and lost property could all occur in the event of a failure.

While levees can help reduce the risk of flooding, they do not completely eliminate it. Levees can and do deteriorate over time and must be maintained to retain their effectiveness. The direct and indirect losses associated with levee failures include injury and loss of life, damage to structures and infrastructure, agricultural losses, utility failure, and stress on community resources.

Drought and Extreme Heat
UPDATE FROM LAST PLAN

- Drought and extreme heat were omitted in the last version of this plan. The MPC decided to profile these hazards because they have not yet been fully mitigated.
- Information on the Drought Impact Reporter (DIR) added.
- Due to NCEI data limits for extreme heat, NOWData was used for impact and some vulnerability.
- In addition, this section was formatted to explicitly address: Location, Previous Occurrence, Future Occurrence (Probability), and Extent. Also explicitly addressed are Impact and vulnerability summary.
- These two hazards were combined as extreme heat is one of the causes of drought.

Hazard Description
Drought is generally defined as a condition of climatic dryness severe enough to reduce soil moisture and water supplies below the requirements necessary to sustain normal plant, animal, and human life. In Texas, drought is often defined in terms of agricultural and hydrologic drought:

- Agricultural drought is considered a dry period of sufficient duration and intensity that crop and animal agriculture are markedly affected.
- Hydrologic drought is considered a long-term condition of abnormally dry weather that ultimately leads to the depletion of surface and ground water supplies. During hydrologic drought, a significant reduction in flow of rivers, streams, and springs is notable.

Texas is divided into ten climatic divisions that range from substantially heavy precipitation through semi-arid to arid climates. Most of Texas is prone to periodic droughts of differing degrees of severity. One reason is the state's proximity to the Great American Desert of the southwestern United States. In every decade since recordation, Texas has fallen victim to one or more serious droughts.

The 2018 Texas HMP Update defines extreme heat as a combination of very high temperatures and, usually, exceptionally humid conditions. When persisting over a period of time, it is called a heat wave. Extreme heat kills by pushing the human body beyond its limits. Under normal conditions, the body's internal thermostat produces perspiration that evaporates and cools the body. However, in extreme heat and high humidity, evaporation is slowed, and the body must work harder to maintain a normal temperature.

Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions are often prerequisites for dust storms.

Most heat disorders occur because the victim has been overexposed to heat or has over-exerted themselves, considering age and physical condition. Other conditions that can promote and exacerbate heat-related illnesses include stagnant atmospheric conditions and poor air quality.

Location-Drought and Extreme Heat
Jefferson County is susceptible to all ranges of drought and extreme heat as defined by the Palmer Drought Severity Index and the NWS Heat Index (see Extent). Since both drought and extreme heat occur on regional scale, all of the JCDD6 is equally at risk as it can occur anywhere in the jurisdiction. The geographic area affected is considered extensive.

Previous Occurrence
According to the National Centers for Environmental Information (NCEI) storm event database, Jefferson County, including the planning area, has experienced seven drought or heat related events in the period from 1996 to 2021. All seven events occurred between 1996 and 2000. The database provides no records of drought or extreme heat events prior to 1996, although presumably occurrences follow the same pattern and frequency as shown in the National Climatic Data Center (NCDC) the predecessor database to the NCEI database. Also note that the drought events are listed by months. For example, if a drought lasts several continuous months, it is listed in the database as separate events. If the continuous months are combined into single events, the number of events is reduced from seven to five events. Table 3-8 describes the events. None of these events are associated with damages, injuries or deaths in Jefferson County.

Table 3-8 Drought and Extreme Heat Events in Jefferson County, 1996 – 2021 (Source: NOAA/NCEI)

Location	Date	Type	Dth	Inj	PrD	CrD	Description
JEFFERSON (ZONE)	05/01/1996	Drought	0	0	0.00K	0.00K	Drought conditions continue across southeast Texas. Rainfall totals from January through May averaged 10 to 15 inches below normal. The main areas affected include farming and fire protection. Crop damage across the entire region exceeded 1 million dollars.
JEFFERSON (ZONE)	05/20/1998 to 7/1/1998	Drought	0	0	0.00K	0.00K	Drought conditions began by mid-May, as southeast Texans had gone over six weeks without any significant rainfall. By the end of May, many locations had seen less than 0.10 inches of rain for the month. This was the start of a significant impact on agriculture and forestry resources. This drought continued into June and July.
JEFFERSON (ZONE)	02/01/2000	Drought	0	0	0.00K	0.00K	The month of February was one of the five driest Februarys on record across southeast Texas. Less than one inch of rain fell across the entire region. The two-month total of January and February 2000 was second driest on record for the Beaumont/Port Arthur area, with less than 2.5 inches of rainfall.

Location	Date	Type	Dth	Inj	PrD	CrD	Description
JEFFERSON (ZONE)	08/29/2000	Heat	0	0	0.00K	0.00K	Record heat occurred in late August across southeast Texas. At the Southeast Texas Regional Airport, the all-time record high of 108 was tied on August 31st. Previously it had been achieved on July 14, 1902.
JEFFERSON (ZONE)	09/01/2000	Heat	0	0	0.00K	0.00K	Record heat which began in late August 2000 continued into the beginning of September across southeast Texas. The all-time record high temperature for the month of September was set on the 4th at Beaumont/Port Arthur with a high of 105.
Totals:			0	0	0.00K	0.00K	

Though the last reported event in the NCEI database is in 2000, since 2010, there has always been a portion of Texas under drought conditions; in fact, Texas has been described as the land of perpetual drought broken by the occasional disastrous flood. The worst drought conditions this century to date took place in April 2011 and continued through February 2012. 100% of the state was under drought conditions.

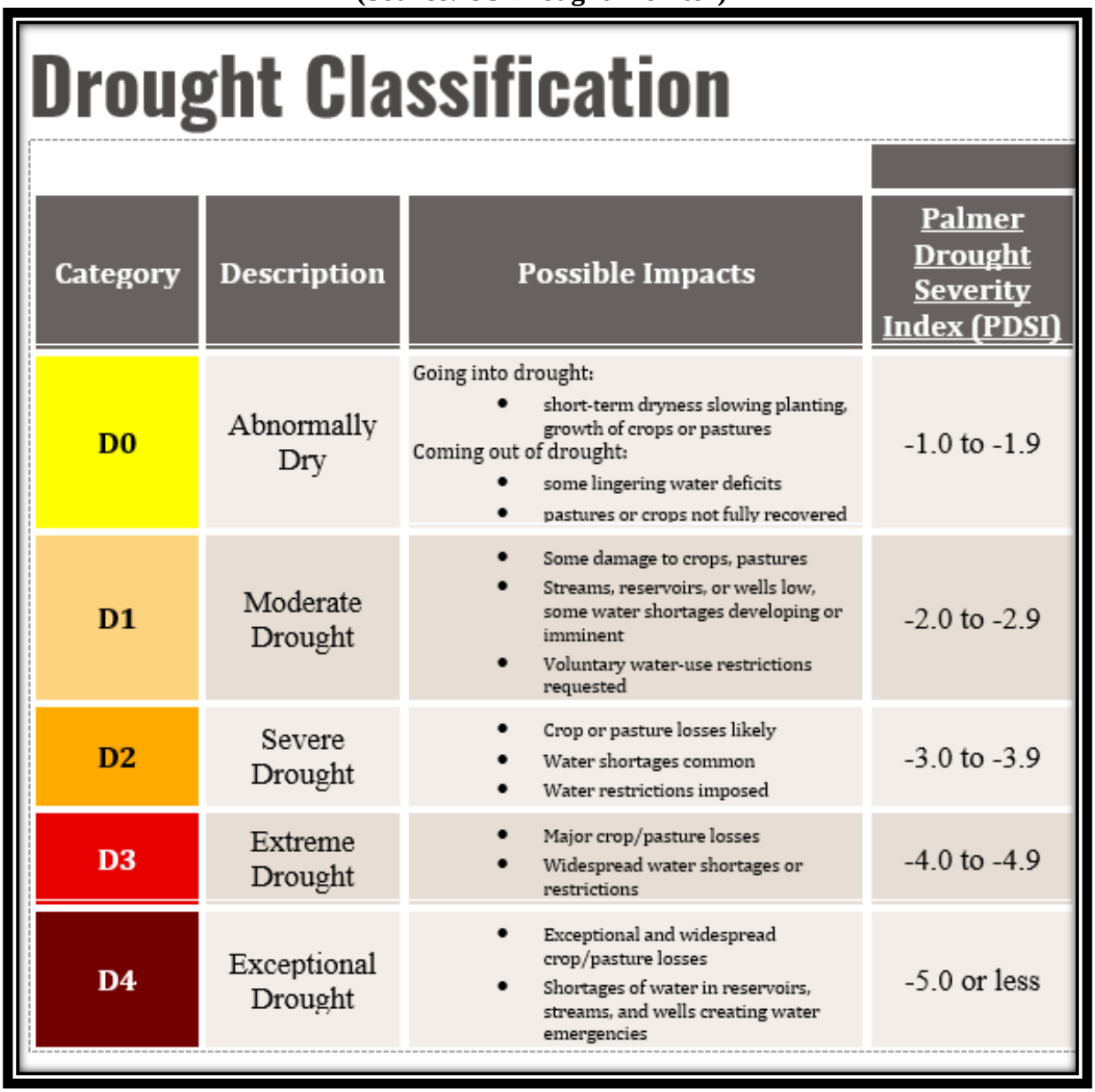
Future Occurrence

Based on six events of drought events within 26 years, a drought or extreme heat event occurs approximately once every 4.33 years on average in Jefferson County and since droughts and extreme heat occur at a regional level, JCDD6 can expect a drought or extreme heat event approximately once every 4.33 years or a 23% chance annually. The probability of future events is considered likely.

Magnitude/Extent

The U.S. Drought Monitor Drought Intensity Scale (Figure L) classifies drought by 5 categories, D0 through D4 with D4 being the most extreme drought conditions. The maximum drought extent experienced for Jefferson County is a Category D3 drought as reported by the U.S. Drought Monitor was in 2011 and 2012 (Figure M). However, many surrounding areas experienced a D4 drought, it is surmised that JCDD6 could experience a maximum D4 Drought. The maximum probable extent the District can expect is considered moderate. Figure N depicts the current drought conditions showing the area is not suffering from any drought conditions as of October 26, 2021. Figure O represents the Palmer Modified Drought Index (PDMI) timeline for Jefferson County showing the lead drought years in red. The PDMI tries to measure the duration and intensity of long-term drought and Figure P shows the NWS Heat Index in August 2000 Jefferson County hit 108 degrees temperature making the potential of heat to be severe.

Figure L US Drought Monitor Intensity Scale
(Source: US Drought Monitor)



Drought Classification

Category	Description	Possible Impacts	Palmer Drought Severity Index (PDSI)
D0	Abnormally Dry	Going into drought: • short-term dryness slowing planting, growth of crops or pastures Coming out of drought: • some lingering water deficits • pastures or crops not fully recovered	-1.0 to -1.9
D1	Moderate Drought	• Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested	-2.0 to -2.9
D2	Severe Drought	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed	-3.0 to -3.9
D3	Extreme Drought	• Major crop/pasture losses • Widespread water shortages or restrictions	-4.0 to -4.9
D4	Exceptional Drought	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less

Figure -M Historical Drought Conditions – Jefferson County (Source Drought.gov)

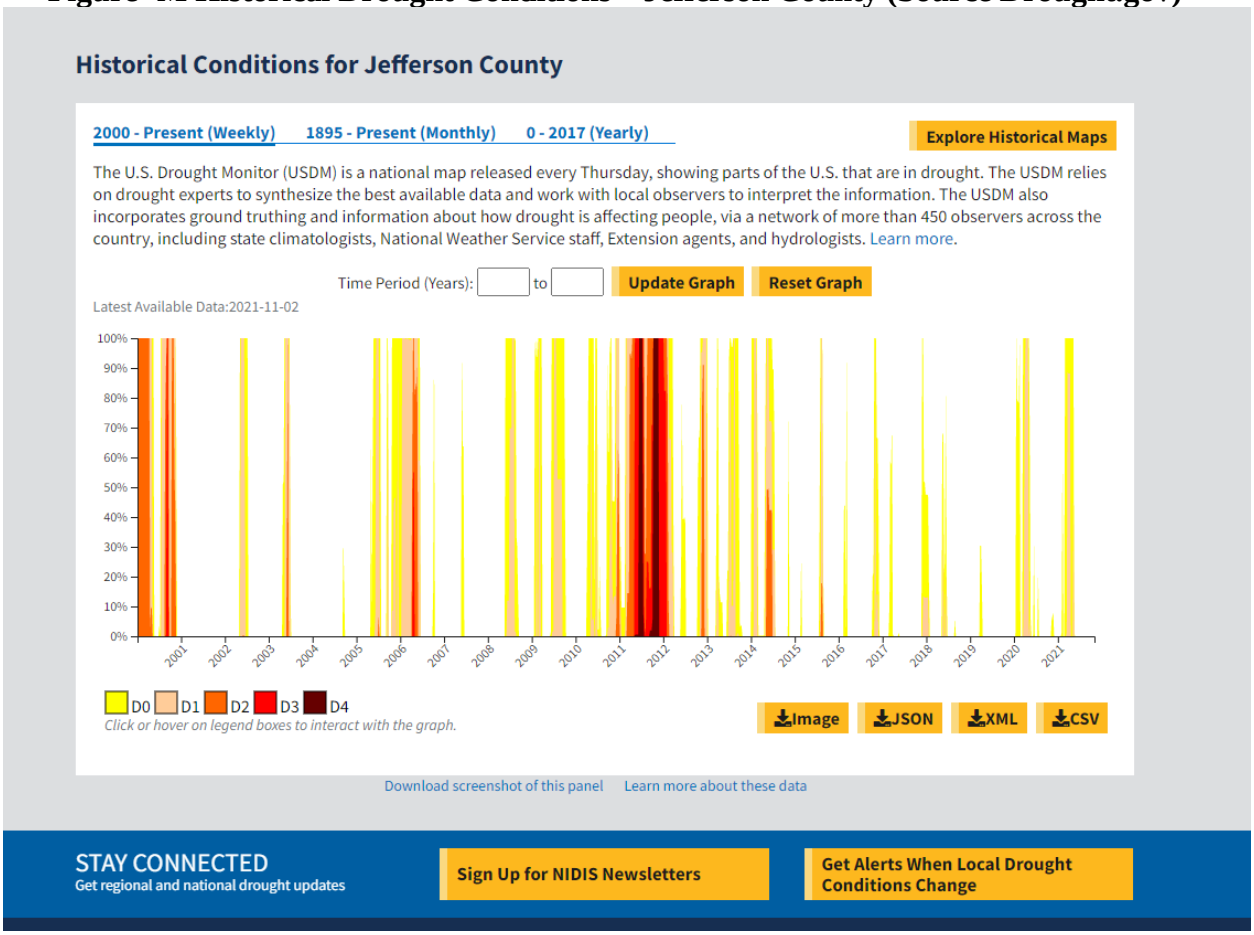


Figure N Current Drought Monitor for Jefferson County (October 26, 2021) (Source Drought.gov)

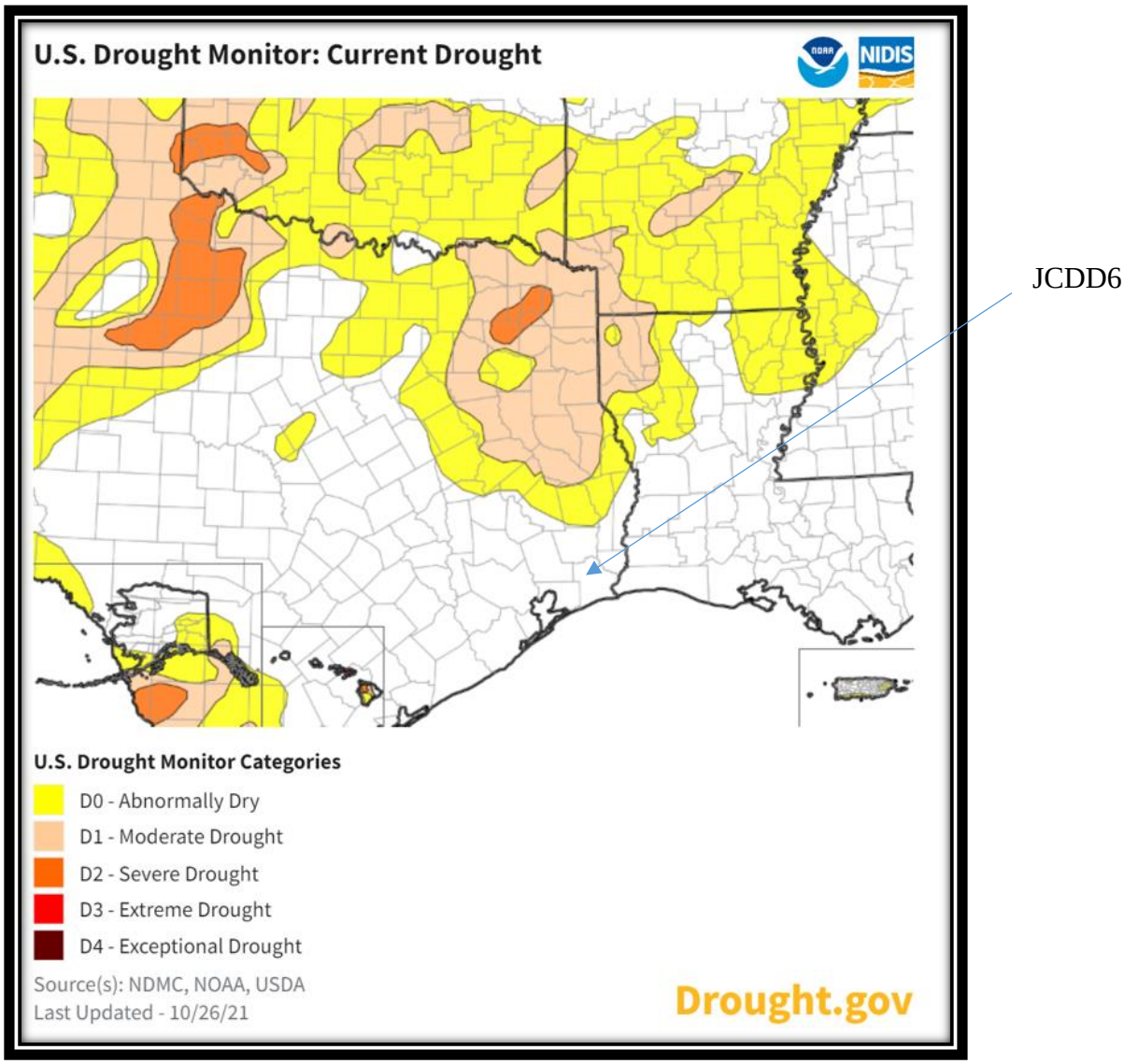
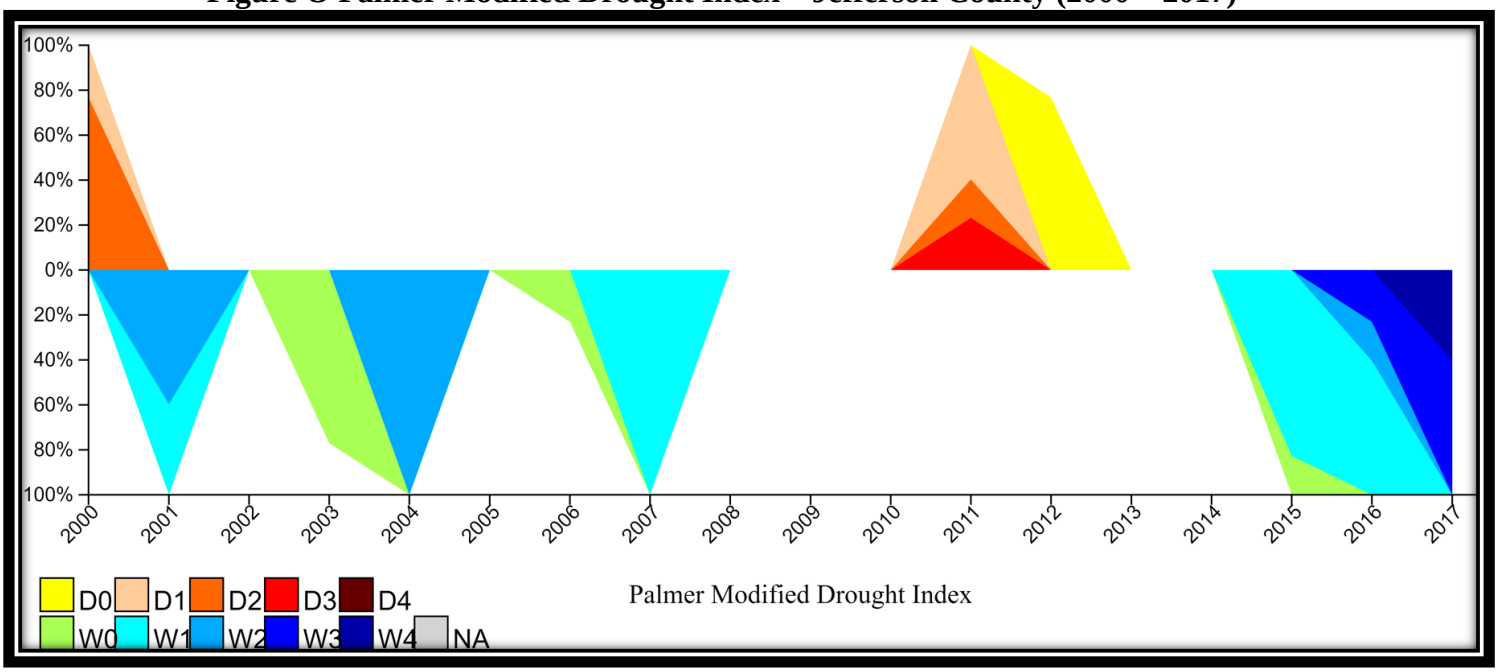


Figure O Palmer Modified Drought Index – Jefferson County (2000 – 2017)



The National Weather Service (NWS) maintains a Heat Index which helps provide information on perceived heat and dangers of exposure considering the relationship between air temperature and relative humidity.

Figure P – NWS Heat Index

Temperature (°F)

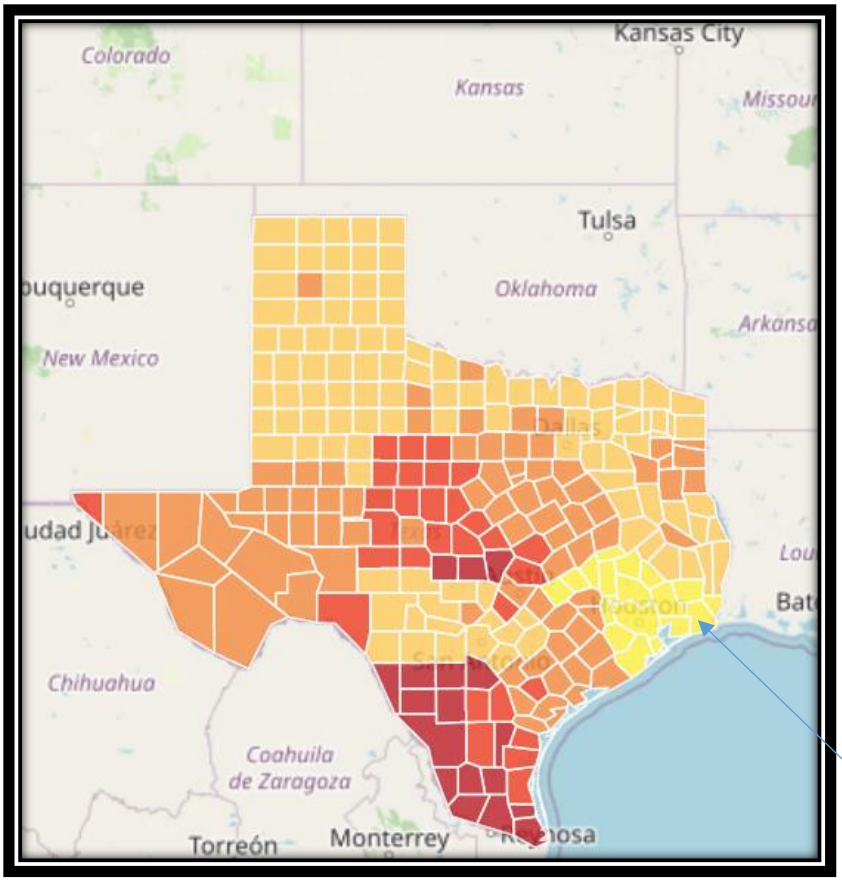
Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

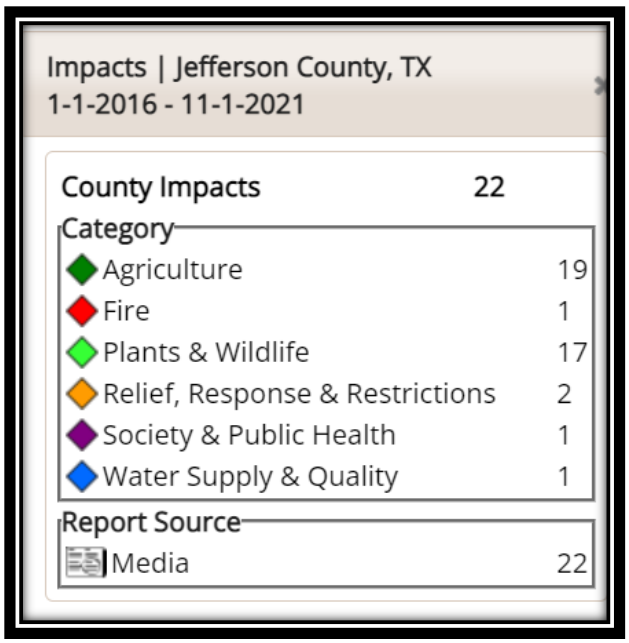
Impact

The Drought Impact Reporter (DIR) is the nation's first comprehensive database of drought impacts. The database contains information from multiple federal agencies including the U.S. Department of Agriculture Risk Management Agency, the National Oceanic and Atmospheric Administration TRACS program and Sectoral Applications Research Program. The DIR reports on County level but since drought impacts on a regional level, it can be surmised that the same impacts were experienced in JCDD6. Figure Q describes the number of impacts reported by category with plants and wildlife, agriculture; relief, response and restrictions and fire being reported (see the report below).

In addition to the impacts reflected in the DIR, drought impacts were greatest on major population centers, prompting water conservation and reduction measures over an extended period. The Texas Agricultural Extension Service projected a $4 billion statewide economic loss as a result of the 1996 drought. In the Southeast Texas area, damage from the extended drought in 2011 reached record proportions as many crops were completely lost and large numbers of animals were sold because of insufficient grazing. In the Southeast Texas region, property damage was estimated at $10 million and agricultural losses were estimated at $100 million. Specific numbers for JCDD6 are not available.

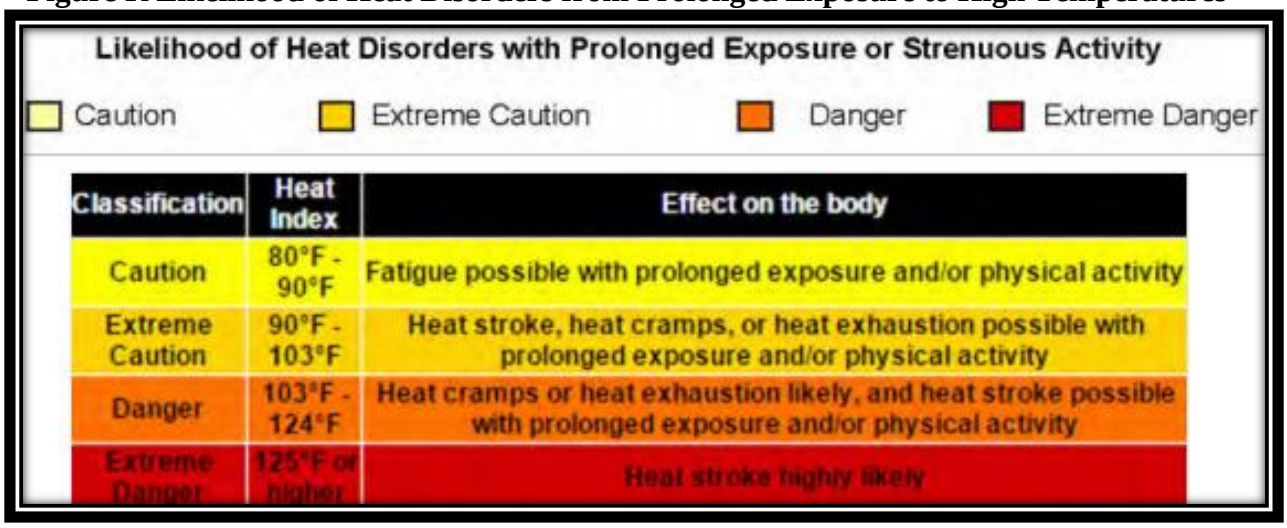
Figure Q Drought Impact Report for Jefferson County, Texas





The NWS also posts the impact of prolonged exposure to Extreme Heat as seen in Figure R.

Figure R Likelihood of Heat Disorders from Prolonged Exposure to High Temperatures



Vulnerability

Though the NCEI reports six drought and extreme heat events, JCDD6's missions and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the effects of drought and extreme heat on District owned facilities and personnel. In extreme cases of drought or extreme heat, the District would need to monitor and support grass stabilization in all maintained ditches. During extreme heat events, District personnel will need to limit time outside and any personnel who have lost power or are unsafe are able to stay at the District's shelter which is air conditioned, has plenty of water and backup power. The overall significance of drought and extreme heat in the planning area is considered medium, but the District's vulnerability is considered low.

FLOOD

UPDATE FROM LAST PLAN

- Events since 2016 were updated and described.
- In addition, this section was formatted to explicitly address: Location, Previous Occurrence, Future Occurrence (Probability), and Extent. Also explicitly addressed are Impact and vulnerability summary.

Hazard Description Flood

When rainfall runoff collects in rivers, creeks, and streams and exceeds the capacity of channels, floodwaters overflow onto adjacent lands. Floods result from rain events, whether short and intense or prolonged and less intense. In recent years, most flooding in JCDD6 has been associated with storms that originate as hurricanes and tropical storms that subsequently move inland.

Floods have been and continue to be the most frequent, destructive, and costly natural hazard facing the State of Texas. Ninety percent of the State's damage reported for major disasters is associated with floods. Records indicate that the streams draining JCDD6 planning area have flooded throughout the County's history. Most recently, since the last version of the plan, JCDD6 has been impacted by 11 flood events, including Hurricane Harvey which is described below.

Location - Flood

The location of the 1% (100-year) and 0.2% (500-year) annual chance event floodplains for Jefferson County Drainage District No. 6 are shown in Figures S and T. These are the locations within the planning area that are at greatest risk of flooding. There are 14,618 NFIP policies in force throughout the County. The geographic area affected is considered extensive.

Figure S – Jefferson County Drainage District No. 6 FEMA Flood Zone Overlay 1%

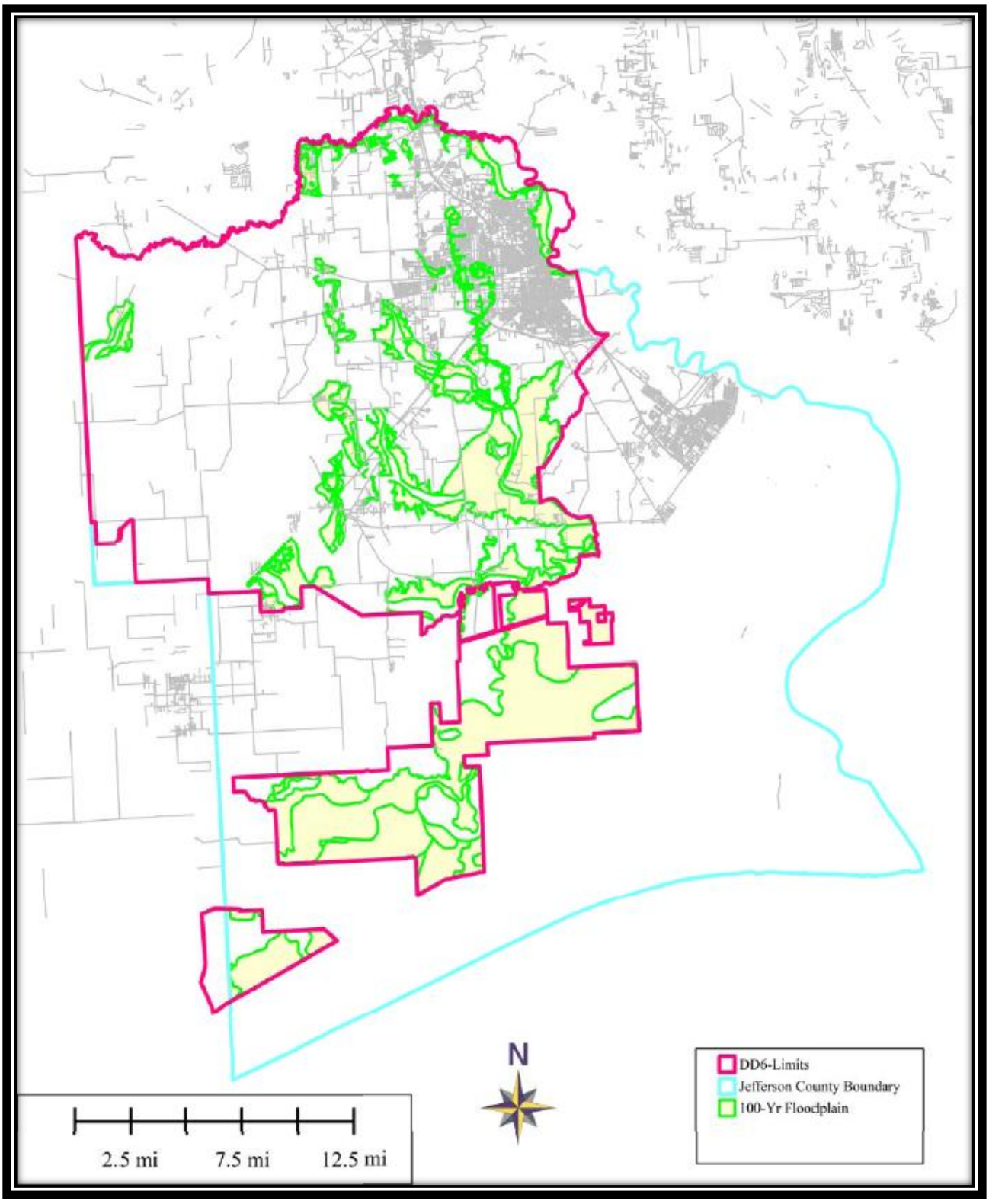
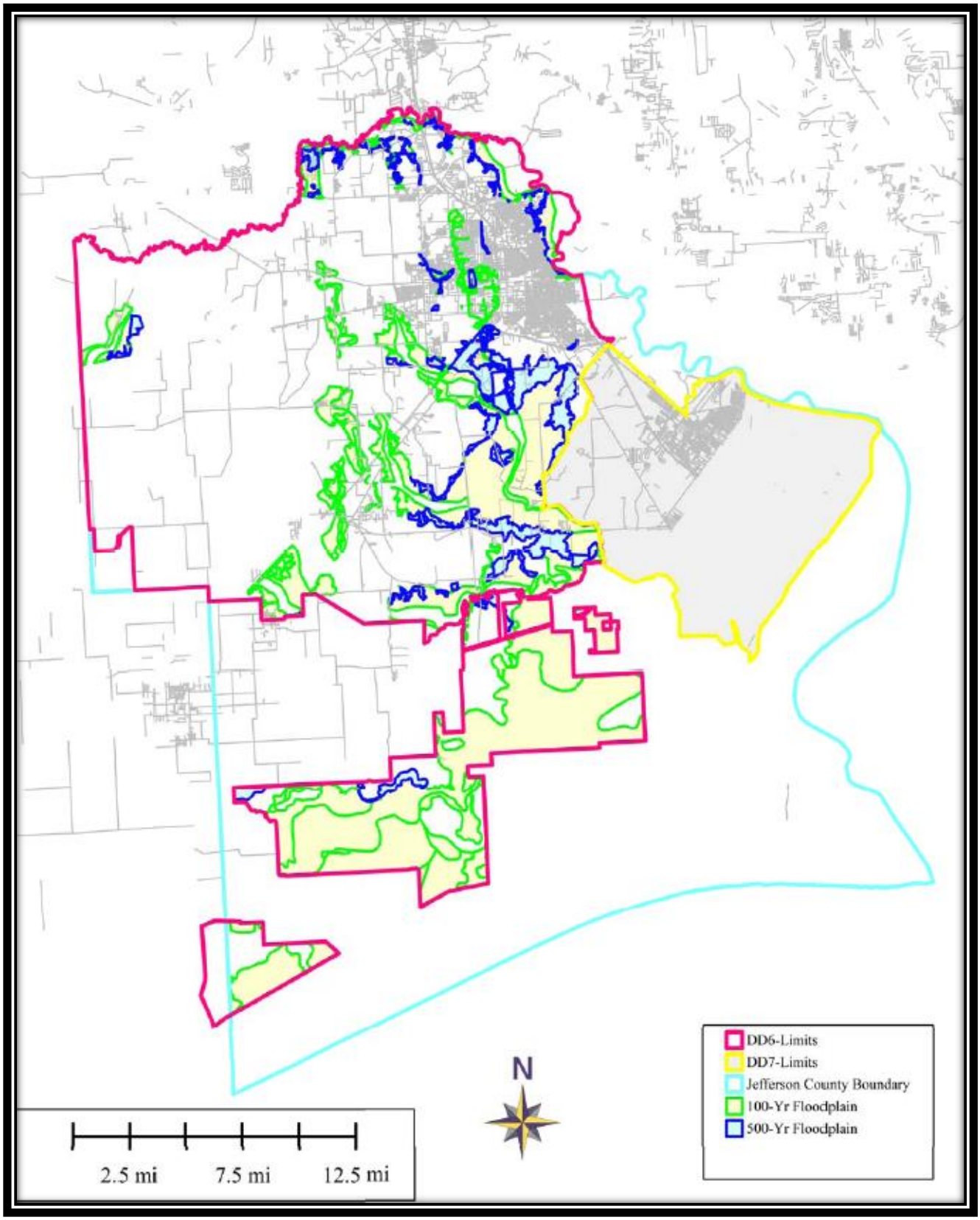


Figure T – Jefferson County Drainage District No. 6 FEMA Flood Zone Overlay 1% and .02%



Previous Occurrences

The NCEI Storm Events Database only lists flood events from 1996 to present. The NCEI indicates that Jefferson County has experienced 85 flood events between 1996 and 2021. Of this total, since the last planning effort was underway, 22 flood events have occurred in the County, 11 of which occurred in the planning area. Property damages for these events totaled just over $3,325 Billion. The NCEI reported 10 deaths and one injury from the 85 flood events. The 11 flood events that have occurred in the District since the last planning effort was under way are listed below.

Table 3-9 Flood Events in Jefferson County Drainage District No. 6 2017 – 2021
(Source: NOAA/NCEI)

Location	Date	Type	Dth	Inj	Property Damage*	Event Description
ELIZABETH	6/4/2017	Flash Flood	0	0		The Jefferson County Sheriff's Department reported street flooding in Beaumont including along Brooks Road.
GILLBURG	6/27/2017	Flash Flood	0	0	$10,000.00	Heavy rain produced street flooding around Beaumont. Pictures and video were also sent in of flooded Porter and Brooklyn Streets.
Jefferson County	8/27/2017	Flash Flood	5	1	$3,000,000,000.00	Hurricane Harvey - Widespread and long duration rainfall produced a storm total rainfall over 40 inches across a large portion of the county. The highest rainfall totals in Jefferson County were 60.58 inches 1.5 mile southwest of Nederland and 60.54 inches 1.3 mile north of Groves. This resulted in over 64,000 homes being flooded. The hardest hit areas were Port Arthur, Groves, Bevil Oaks, Hamshire, Fannett, China, and northeast Beaumont. Several refineries in the county also received floodwaters and were offline for an extended period. City and county infrastructure was also damaged with water pumps and treatment plants being inundated. Record crests were observed along Pine Island and the lower Neches. 5 deaths were reported by flooding.
GROVES	1/27/2018	Flash Flood	0	0	$1,000,000.00	An incoming short wave provided ample lift of a very moist air mass to produce several hours of rainfall over Jefferson County. 8 to 12 inches of rain fell which caused flooding. A strong cold front then pushed through the area with north winds pushing the tides out for a few days.
BEAUMONT	6/18/2018	Flash Flood	0	0	$5,000.00	Underpasses flooded along MLK Blvd with at least one car stalled during the heavy rain event where near 8 inches fell.
AMELIA	9/3/2018	Flash Flood	0	0	$0.00	Numerous roads were closed in Beaumont, Groves, and Port Arthur due to flooding including underpasses which had up to 5 feet of

Location	Date	Type	Dth	Inj	Property Damage*	Event Description
						water. Photos also indicated water levels approached some structures. Rainfall reports from JCDD6 recorded 4 to 8 inches, however radar estimates indicated some areas in the City may have received around 9 inches during the morning.
CENTRAL HGTS	11/7/2018	Flash Flood	0	0	$10,000.00	Multiple streets were flooded during the storm with some impassable. At least 1 vehicle was stalled on Taft AVE. this storm also cause a nearby tornado and hail
BEAUMONT	5/10/2019	Flash Flood	0	0	$0.00	Water flooded portions of MLK Jr Parkway impassable near Lamar. Underpasses were flooding on the roadway.
HAMSHIRE	9/18/2019	Flash Flood	3	0	$300,000,000.00	The remnants of Imelda drifted slowly across the interior sections of Southeast Texas during the 18th. A very heavy band of rain dumped over 30 inches of rain in a 12-hour period which created extensive flooding across Jefferson County. The maximum storm total was 44.29 inches near Fannett. The first report of flooding was from the Jefferson County Sheriff's Department with major street flooding in the city of Beaumont and water was entering several homes. Due to the intense rate at which the rain fell flooding depth was worse than Harvey at some locations. Over 5100 homes were flooded. Numerous high-water rescues were conducted throughout the county. Three people drowned in Jefferson County during the event, 2 men ran off the roadway and into a ditch in different events. Per a family press release, the other man was struck by lightning, but fell in the flood waters and drowned while attempting to save a horse. Drowning was considered the primary cause of death.
PINE CREST	5/14/2020	Flash Flood	0	0	$75,000.00	Multiple roads in Beaumont were flooded and closed. Some vehicles in a car dealership were flooded and water approached several homes and businesses. A home rain gauge in the area recorded 5.72 inches during the event.
CHEEK	5/17/2021	Flash Flood	0	0	$5,000,000.00	A slow-moving thunderstorm produced 10 to 16 inches of rain over the Hampshire - Fannett area which flooded numerous homes, businesses, vehicles, and streets.
					$3,306,100,000.00	

**Damage estimates for certain events are Countywide, or the larger local area and are not specific to JCDD6, but the entire area affected from those floods.*

Future Probability

Jefferson County Drainage District No. 6 has experienced 11 flood events between 2017 and 2021. 11 events reported over 5 years suggests a flood occurs more than once per year on average, though frequently, it is limited to street flooding and costs confined to debris removal. This probability follows the same pattern as prior years, with 85 events in the County (fewer within District limits) over a 25-year period, the District can expect at least one flood event each year. The future probability is considered highly likely.

Flood Magnitude/Extent

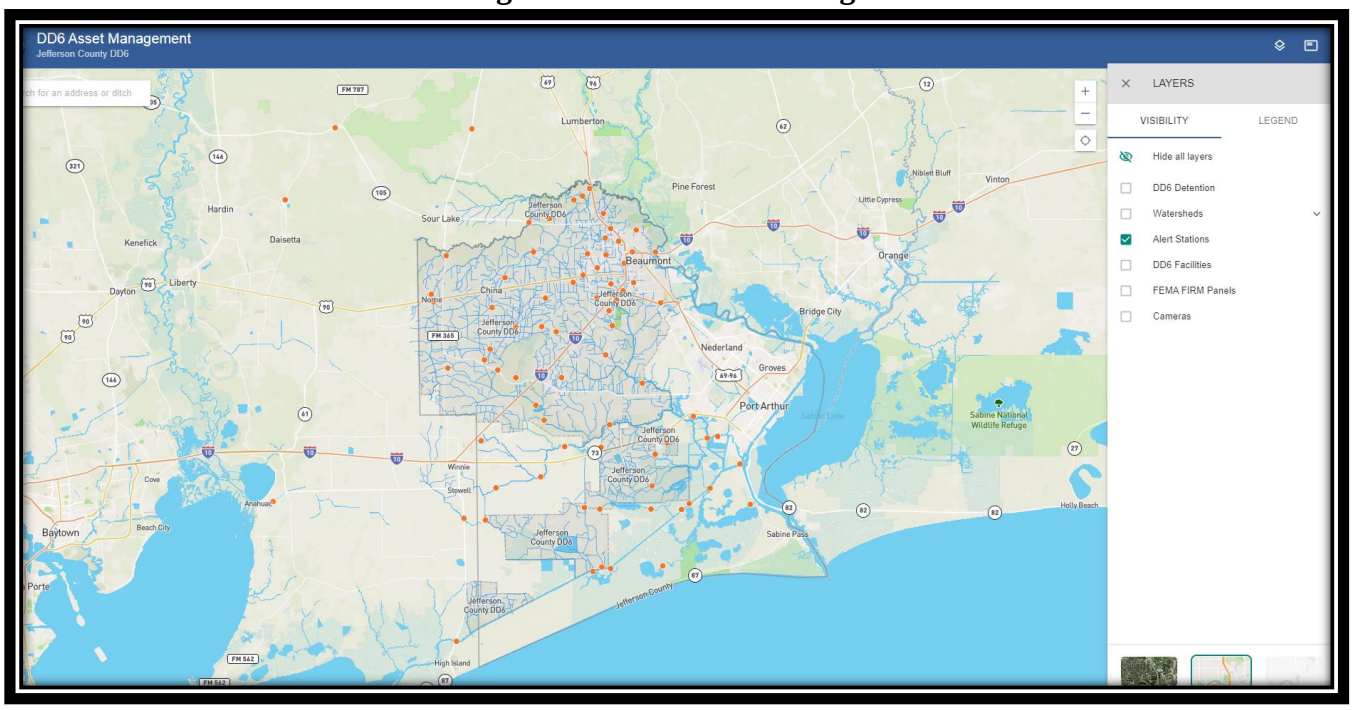
Flood severity is measured in various ways, including frequency, depth, velocity, duration and contamination, among others. In JCDD6, characterizing the severity of the flood hazard depends on what part of the District is being considered, but generally speaking the issues relate to how often floods occur. Floods are and continue to be the most frequent, destructive, and costly natural hazard facing Jefferson County Drainage District No. 6.

Flash floods almost always result from rains associated with hurricanes and tropical storms. The planning area also experiences the second greatest frequency of thunderstorms in the United States and is conducive to frequent, heavy rainfall – which typically results in an annual rainfall of over 50 inches. The flooding problems in the District are considered severe in some areas. The flat terrain, clay soils and impervious surfaces found in this area contribute to the flood problem. In the planning area, there are 14,618 active flood insurance policies, many of which sit within the floodplain. Flooding can occur during any month of the year in JCDD6; however, the greatest likelihood of the occurrence is mid-summer to early winter. Mid-summer flooding (July, August, and September) is most likely to result from tropical storm and hurricane development. Flooding in the fall to early winter (October, November and December) usually results from stationary weak cold fronts.

JCDD6 has been actively pursuing projects to reduce the severity of flooding in the area. There are 86 rain gauges throughout the District that are monitored for water levels and rainfall totals, see Figure U for their locations.

The maximum probable extent of a future flood is considered extreme.

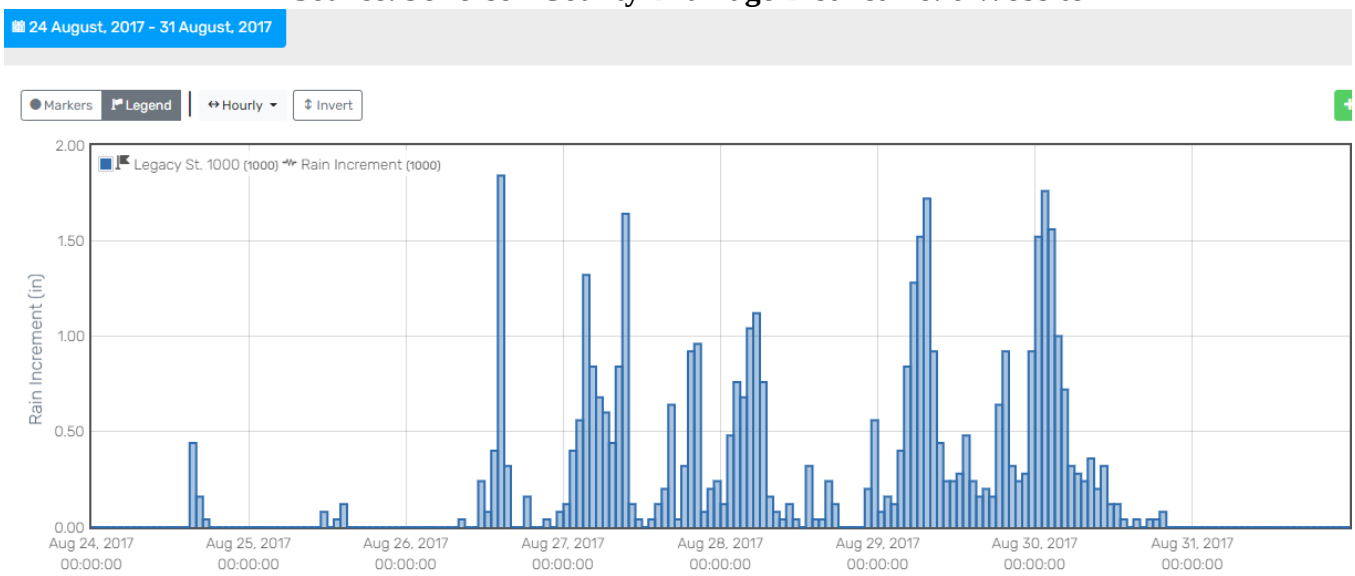
Figure U JCDD6 Rain Gauges



These gauges show real time data including water level, rain increment, water temperature, location and pictures. The charts below show the water level and rain fall total for two gauges during the period before and after Hurricane Harvey.

Table 3-10 Flood Water Elevation at St. 1000 Black Creek @ State Highway 326
Source: Jefferson County Drainage District No. 6 Website

Table 3-11 Rainfall Total for the Legacy St 1000 Gauge
Source: Jefferson County Drainage District No. 6 Website



As noted by the above figures, Hurricane Harvey dropped huge amounts of rain in a short period of time. Many nearby gauges show similar data. This information can be retrieved for any day, event or time period after the gauges were installed.

Impact

The following describes the inventory counts for buildings in Jefferson County Drainage District No. 6 as reported by the Jefferson County Appraisal District.

Table 3-12 Structures within Jefferson County Drainage District No. 6

Type	Number of Structures
Single Family Homes	43,602
Multi-family Homes	701
Total Residential	44,303
Commercial Buildings	3,688
Infrastructure and Utility Buildings	2,053
District Owned Buildings	7
District Owned other facilities*	8

* Non-four wall infrastructure that is insured.

Flood insurance policies and claims information can be used to identify buildings in mapped floodplains (where lenders require insurance) and where flooding has occurred (where owners are sufficiently concerned that they purchase flood insurance even if not required). This characterization of flood risk is described below.

Data provided by FEMA indicate that as of October 2021, 14,618 federal flood insurance policies were in-force. Some of those 14,618 are within unincorporated Jefferson County, therefore some of those may not be within the District boundaries. These insurance policies are

administered by the National Flood Insurance Program (NFIP). In addition to number of policies, FEMA defines properties based on the number of claims and then classifies them. The definitions are

FEMA defines Repetitive Loss (RL) as any property which has two or more flood insurance claims of at least $1,000 within a ten-year period. There are 1,333 Repetitive Loss (RL) structures. Included in the total repetitive loss number are Severe Repetitive Loss (SRL) properties. FEMA defines SRL includes single or multi-family residential properties covered by the National Flood Insurance Program (NFIP) insurance policy that meet the following criteria:

a. Properties that have incurred flood-related damage for which four or more separate claims payments have been made, with the amount of each claim (including building and contents payments) exceeding $5,000, and with the cumulative amount of such claim's payments exceeding $20,000; or
b. Properties for which at least two separate claims payments (building payments only) have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the building.

In both instances at least two of the claims must have been within 10 years of each other and claims made within 10 days of each other are counted as a single claim.

297 of the 1,333 are Severe Repetitive Loss (SRL) structures in JCDD6. Of the total RL properties 1,333 properties, 953 are insured and thus, 28.5 percent are not insured. 224 of the 297 Severe Repetitive Loss structures are currently insured and thus, approximately 24.6 percent are not insured as illustrated below.

	Repetitive Loss (RL) (includes SRL)	**Severe Repetitive Loss (subset of RL)**	**RL less SRL**
Total	1,333	297	1,036
Insured	953	224	729
Non-Insured	380	74	306

NFIP Repetitive Loss (RL) Properties

In recent years, FEMA has focused considerable attention on the Repetitive Loss (see definition above) subset of insured buildings. FEMA's database identifies 1,036 properties as RL properties in JCDD6 (SRL properties are broken out and analyzed separately). This number includes properties with active flood insurance policies as well as those with inactive policies. Note that the RL properties below do not include those listed as mitigated on FEMA's database. Collectively, they had received claim payments of over $162 million (includes payments for building damage and contents damage).

As of October 2021, repetitive loss statistics for areas within JCDD6 showed 1,036 Repetitive Loss properties. Of this total, 989 were categorized as residential properties and 47 were non-

residential. Table 3-13 summarizes the RL Statistics for Jefferson County Drainage District No. 6 (SRL properties are broken out and analyzed separately).

Table 3-13 RL Statistics for Jefferson County Drainage District No. 6 (Source: FEMA, 2021)

Properties	Building Payments	Contents Payments	Total	# of claims	Average
1,036	$119,133,267	$42,942,198	$162,075,465	2,424	$66,862

Flood Risk to Residential Repetitive Loss Properties

Table 3-14 provides a summary of residential repetitive flood insurance claims for individual streets with ten homes or more on the RL List in JCDD6. The building, contents, and total claims data has been combined for streets that include more than one repetitive loss property. Address data about individual sites is omitted for privacy reasons. The table shows that the 132 residential repetitive loss properties received claim payments over $23 million (includes payments for building damage and contents damage).

Table 3-14 Summary of Residential NFIP Repetitive Loss Statistics; JCDD6, TX

Street Name	RL Properties	Number of Claims	Total Paid	Average Claim Payment
******** (apartments)	18	44	$339,600 (building payments only)	$7,718
*********	15	30	$4,002,976	$133,433
*********	13	26	$2,593,050	$99,732
*********	12	32	$1,675,474	$52,359
*********	12	26	$2,750,761	$105,799
*********	11	25	$1,940,953	$77,638
*********	11	22	$2,345,171	$106,599
*********	10	23	$2,748,495	$119,500
*********	10	23	$2,177,613	$94,679
*********	10	21	$2,213,283	$105,394
*********	10	23	$884,163	$38,442
Grand Total	**132**	**295**	**$23,671,539**	**$80,243**

The above table shows those streets with 10 or more RL properties. There are another 591 RL properties in the district on 84 streets each with two to nine properties per street totaling over $100 Million in paid claims. JCDD6 has an extensive history of repetitive loss flood claims, so it is possible to perform a relatively simple statistical risk assessment using average annual losses and a present value coefficient calculation to project losses over a planning horizon. Residential flood risk is calculated by a simple methodology that uses the FEMA default present-value coefficients from the benefit-cost analysis software modules. To perform this calculation, the repetitive loss data were reviewed to determine an approximate period over which the claims occurred. This method should not be used for risk assessments for individual properties because of the generalizations that are used, but the method is appropriate for larger numbers of properties and policies that are spread over an entire jurisdiction. It is presumed that more accurate figures would be somewhat higher because the underlying statistics are for properties that had flood insurance, were flooded, and had paid claims. There are nearly always some properties in a jurisdiction that are flooded in big events, and do not have flood insurance (or did not make claims) and are thus not represented in the sample.

Most of the flood claims in this query occurred between 1979 and 2021, a period of 42 years. Table 3-15 summarizes the projected 100-year risk to all RL and SRL properties. Based on a 100-year horizon and a present value coefficient of 14.27 (the coefficient for 100 years using the mandatory Office of Management and Budget (OMB) discount rate of 7.0 percent), the projected flood risk to these properties is shown at the bottom of the table. FEMA guidance defines net present value as "The benefits of a mitigation measure that are counted into the future (for the duration of the project useful life) and then discounted using an OMB-established discount rate." Taking the historical losses of $244,212,397 experienced over a 42-year period, derived annualized losses are $5,814,580. To determine the net present value of annualized losses of $5,814,580 over a one-hundred-year horizon, the 100-year net value coefficient is used to -14.27. The calculated net present value of a $5,814,580 annual loss over the next 100 years is $82,974,056.

The difference between $244,212,397.18 experienced over a 42-year period and a projected $82,974,056 over the next 100 years, is that the latter is a net present value calculation. It must be understood that individuals can obtain and cancel flood insurance policies, and the flood hazard depends on many variables, including the weather, so this projection is simply an estimate of potential damages. Therefore, if not mitigated, the net present value of projected flood risk over a 100-year timeframe is $82,974,056. While it is an estimate, it offers a useful metric that can be used in assessing the potential cost effectiveness of mitigation actions.

Table 3-15– Projected 100-year Flood Risk in JCDD6 to Severe Repetitive Loss and Repetitive Loss Properties (Source: FEMA NFIP query October 2021)

Data	Value
Period in years	42
Number of claims	3,511
Average claims per year	83.6
Total value of claims	$244,212,397.18
Average value of claims per year	$5,814,580.88
Projected risk, 100-year horizon	**$82,974,056.16**

Table 3-16 shows the above risk to just residential Repetitive Loss Properties. There have been 2,319 claims in the 42-year period, for an average number of 55.2 claims per year.

Table 3-16 – Projected 100-year Flood Risk in JCDD6 to Residential Repetitive Loss Areas (Source: FEMA NFIP query October 2021)

Data	Value
Period in years	42
Number of claims	2,319
Average claims per year	55.2
Total value of claims	$153,868,278.00
Average value of claims per year	$3,663,530.43
Projected risk, 100-year horizon	**$52,278,579.24**

Non-Residential Repetitive Loss Properties

As noted earlier, as of October 2021, JCDD6 had 47 non-residential repetitive loss properties in the NFIP database. Table 3-17 provides a summary of non-residential repetitive loss claims for nine individual streets in JCDD6 with two or more non-residential RL properties. Similar to the residential repetitive loss data, address data about individual sites is omitted for reasons of privacy.

Table 3-17– Projected 100-year Flood Risk, Non-Residential Repetitive Loss Properties in JCDD6 (Source: FEMA NFIP query October 2021)

Street Name	Claims	Properties	Total Claims ($)	Average Claim Payment
********	9	4	$1,979,680.95	$219,964.55
********	9	4	$1,011,502.51	$112,389.17
********	6	3	$977,441.69	$162,906.95
********	4	2	$365,571.97	$91,392.99
********	4	2	$246,350.62	$61,587.66
********	4	2	$134,125.79	$33,531.45
********	4	2	$125,341.55	$31,335.39
********	4	2	$106,969.47	$26,742.37
********	4	2	$80,307.34	$20,076.84
Total	**48**	**23**	**$5,027,292.89**	**$104,735.27**

The above table just shows those streets with multiple RL non-residential properties. There are 24 more non-residential RL properties that are each on a different street. Those 24 properties have claims totaling $3,179,895.00. It should be noted that some of the non-residential properties on this list may be at far greater flood risk than indicated, because there may have been periods where the owner(s) did not carry flood insurance, with the result that these properties may have been damaged, but there is no record of it in the NFIP. This type of analysis, therefore, is not definitively conclusive. Absent the NFIP data, it would be, however, possible to perform relatively simple engineering studies to better assess risks for properties with just a few claims, but where historical data suggests an area may be vulnerable to additional flood-related losses.

The information in this section should be used for planning purposes only, i.e., as the basis for additional steps in risk assessment, and eventually (where warranted) targeted mitigation actions to reduce the risk. For example, a property that has received a number of claim payments not much higher than $1,000 would be considered an unlikely candidate for mitigation using public funds. It may, however, be an excellent candidate for damage-reduction actions taken by the owner.

The same statistical risk assessment using average annual losses and a present value coefficient calculation to project losses over a planning horizon can be used for the non-residential properties in Table 3-18.

Table 3-18 – Projected 100-year Flood Risk in JCDD6 to Non-Residential Repetitive Loss Areas (Source: FEMA NFIP query October 2021)

Data	Value
Period in years	42
Number of claims	105
Average claims per year	2.5
Total value of claims	$8,207,188.23
Average value of claims per year	$195,409.24
Projected risk, 100-year horizon	**$2,788,489.85**

NFIP SEVERE REPETITIVE LOSS PROPERTIES

In 2004 FEMA began to develop the Severe Repetitive Loss (SRL) Grant Program in an effort to reduce or eliminate flood damages to residential properties that met certain minimum requirements. FEMA initiated the program early in 2008. The SRL Grant Program has since been included in the FMA Grant Program, with SRL properties being a top priority. An SRL property is defined on page 68. SRL properties are a subset of the RL list, but were not included in the analyses above. As of October 2021, JCDD6 had 297 properties on the SRL list. 224 of those are insured, 206 of which are residential, 18 non-residential.

Table 3-19 provides loss estimates for SRL properties in JCDD6 summarized at the street level, as calculated by FEMA and the NFIP.

Table 3-19– Projected 100-year Flood Risk, Streets with >3 SRL Properties in JCDD6 (Source: FEMA/NFIP, Query October 2021)

Street Name	Properties	Claims	Total Claims ($)	Average Claim Payment
**********	11	35	$1,836,405.76	$52,468.74
**********	8	41	$2,010,885.05	$49,045.98
**********	7	41	$2,559,135.50	$62,417.94
**********	7	17	$2,451,026.25	$144,188.60
**********	6	21	$2,329,738.43	$110,939.93
**********	5	24	$1,753,574.23	$73,065.59
**********	5	27	$1,528,250.59	$56,601.87
**********	5	10	$1,128,660.84	$112,866.08
**********	5	33	$961,340.21	$29,131.52
**********	4	9	$1,277,232.84	$141,914.76
**********	4	15	$658,750.55	$43,916.70
	67	**279**	**$18,495,000.25**	**$ 66,290.32**

The above table shows those streets with four or more SRL properties. There are another 123 SRL properties in the District on 55 streets each with two or three properties per street totaling

over $36 Million in paid claims. The remaining 10 properties are on streets without other SRLs. Table 3-20 summarizes the projected 100-year flood risk to SRL areas.

It should be noted that some of the properties on this list may be at far greater flood risk than indicated, because there may have been periods where the owner(s) did not carry flood insurance, with the result that they may have been damaged but there is no record of it. This type of analysis is not totally conclusive. It would be possible to perform relatively simple engineering studies to better assess risks for properties with just a few claims, but where data suggests that sites may be vulnerable to additional flood-related losses.

The information in this section should be used for planning purposes only, i.e., as the basis for additional steps in risk assessment, and eventually (where warranted) targeted mitigation actions to reduce the risk.

Table 3-20– Projected 100-year Flood Risk in JCDD6 to Severe Repetitive Loss Areas (Source: FEMA NFIP query October 2021)

Data	Value
Period in years	42
Number of claims	722
Average claims per year	17.19
Total value of claims	$ 57,464,761.83
Average value of claims per year	$1,368,208.62
Projected risk, 100-year horizon	**$19,524,336.94**

FLOOD RISKS – PUBLIC BUILDINGS

JCDD6 owns one complex that include seven buildings and eight other facilities/infrastructure on Walden Road (Figure V). These buildings are not located in the Special Flood Hazard Area and have never experienced flooding.

Figure V – JCDD6 Owned Facilities

Public Schools. The Beaumont Independent School District (BISD) owns all of the areas 32 public schools. A review of the FIRM indicates none of these are in the mapped floodplain. As part of the 2021 plan update, the FIRM maps were again reviewed and verified that none of the 32 schools within the BISD are located within the floodplain.

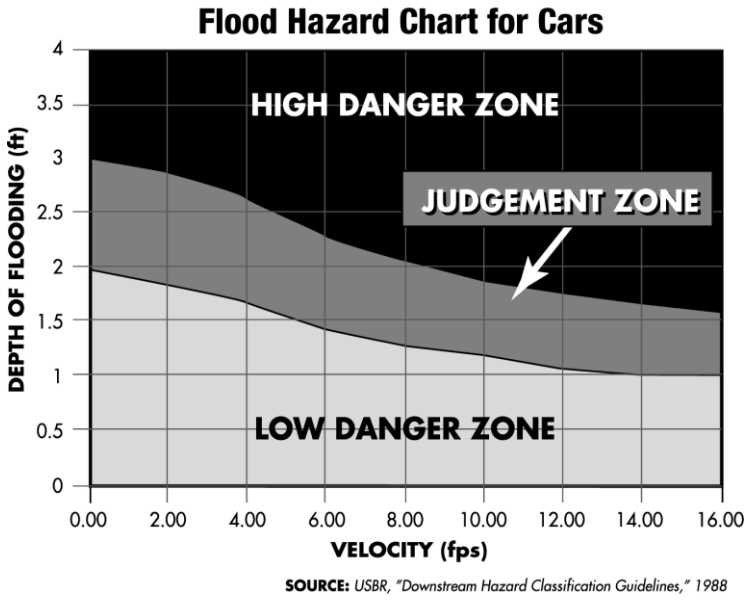
FLOOD RISKS – DISTRICT ASSETS

Aside from District facilities, JCDD6 also owns other assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles totaling to $22,892,359 in insured value. Those vehicles are mainly stored on District property, far from the floodplain. However, some of these vehicles are often in use and at various project sites that may sit in a flood prone area. JCDD6 closely monitors the weather and takes proactive steps, when possible, to move vulnerable equipment to higher ground when equipment is being operated or staged in a flood prone area.

FLOOD RISKS – ROADS

Nationwide, flooded roads pose the greatest threat to people during floods. Most of the more than 200 people who die in floods each year are lost when they try to drive across flooded roads. Driving into water is the number one weather-related cause of death in Central Texas. Statewide, between 1960 and 1996, 76% of flood-related deaths were vehicle-related. As illustrated in Figure W, flood hazards for cars vary with both velocity and depth of floodwaters. Many cars will float in less than 24 inches of water. Fast-moving water can quickly wash cars off the road or wash out a low section of road.

Figure W – Flood Hazard Chart for Cars (Source: Downstream Hazard Classification Guidelines)



Although most roads in the area are unlikely to have deep or fast-moving water during flood conditions up to the level of the 100-year flood, many are still known to flood regularly. Within

the City of Beaumont and Jefferson County there are approximately 1,165 miles of roads (750 miles within the City, and 415 within the County).

The Texas Department of Transportation (TXDOT) maintains the freeways that run through the City and County. These major roadways include the following:

- Cardinal
- I-10
- Eastex Freeway
- College (90) – (from I-10 to the west)
- Fannett Rd (from Cardinal to the west)
- Martin Luther King (from I-10 to the south)

Due to the extensive and common road flooding in JCDD6, it would be nearly impossible to generate a list of flood-prone roads. Due to this reason, the City and County monitor roads and respond accordingly. The City will close roads as well as close major underpasses where water tends to get much deeper. This is accomplished by waiting until the water is deep enough to warrant the closure. There are water depth signs at these major underpasses and select lowest lying roads have graduated water depth monitors.

When building new State roads or upgrading existing roads, TxDOT considers the NFIP's floodplain and floodway requirements to evaluate the impact of new and replacement structures. The City and County consider floodplain and floodway impacts in its planning and design for area roads. Within the City of Beaumont, developers must satisfy the City's drainage criteria and other aspects of road designs in order for the City to accept ownership. Replacing roads and bridges damaged or washed out by floods costs millions of dollars each year. If the damage is caused by a Presidentially-declared disaster, FEMA may pay up to 75% of the repair or replacement costs, with the remaining 25% covered by the State and local governments. The full costs of a damaging event that is not declared a major disaster must be borne by the State and local communities.

TXDOT inspects State bridges for structural integrity and to determine if erosion is a risk. Where erosion has been identified, stabilization measures have been put into place.
Roads and drainage structures in the area have sustained limited erosion damage due to flooding. Damage has occurred to two bridges in area, the bridge on Phelan, and the Bridge on Longhorn Rd. Staff interviews resulted in the following characterizations of past road flooding:

- Most roads in the area are designed to carry water and, therefore, flood even in small events.
- The worst street flooding tends to be on feeder roads.

FLOOD RISKS – LOCAL DRAINAGE

Many areas and streets experience accumulations of rainfall that are slow to drain away, which may cause disruption of normal traffic, soil erosion, and water quality problems. Local drainage problems contribute to the frequency of flooding, increase ditch maintenance costs, and are perceived to adversely affect the quality of life in some neighborhoods.

Many areas prone to shallow, local drainage flooding are not shown on the City or County's Flood Insurance Rate Maps. One measure of the magnitude of this problem is the number of flood insurance policies in-force on buildings that are outside of the mapped floodplain. Local drainage flooding throughout some subdivisions in JCDD6 is a problem, even during frequent rainstorms. It is a concern because access for emergency services (fire, emergency medical) can be limited. While the depth of water generally is relatively shallow, a number of homes have been flooded repetitively and are identified by FEMA as repetitive loss properties.

When building new state roads or upgrading existing roads, TxDOT considers the NFIP's floodplain and floodway requirements to evaluate the impact of new and replacement structures. The local Cities and County similarly considers floodplain and floodway impacts in its planning and design for roads. Developers must satisfy the City's or County's drainage criteria and other aspects of road designs in order for them to accept ownership. Specific to reducing flood risks, the low chord of any new bridges must be at least one foot above the Base Flood Elevation.

Replacing roads and bridges damaged or washed out by floods costs millions of dollars each year. If the damage is caused by a Presidentially-declared disaster, FEMA historically reimburses to 75% of the repair or replacement costs, with the remaining 25% covered by the state and local governments. The full costs of a damaging event that is not declared a major disaster must be borne by the state and local communities.

TxDOT inspects state bridges every two years for structural integrity and to determine if erosion is a risk. Where erosion has been identified, stabilization measures have been put into place.

Vulnerability

Properties identified as Repetitive Loss (RL), or Severe Repetitive Loss (SRL) properties are considered vulnerabilities due to the fact that they are documented structures that are repeatedly impacted by flooding hazards. This data is especially important due to the fact that this data may, at times, identify structures that suffer from localized flooding outside of the designated Special Flood Hazard Area. As mentioned above, homeowners living in RL or SRL properties are vulnerable as well as critical infrastructure including buildings, facilities, roads and drainage systems. Other properties that are not RL or SRL can and have sustained damages from very severe storms or unforeseen circumstances. The overall significance of flooding in the District is considered high.

Jefferson County and Beaumont both have alert systems in place to notify residents of incoming disasters. Figure X illustrates the where repetitive loss properties for both residential and commercial structures are in the District. Figure Y depicts where severe repetitive loss properties for both residential and commercial structures.

Figure X – RL Structures in Jefferson County

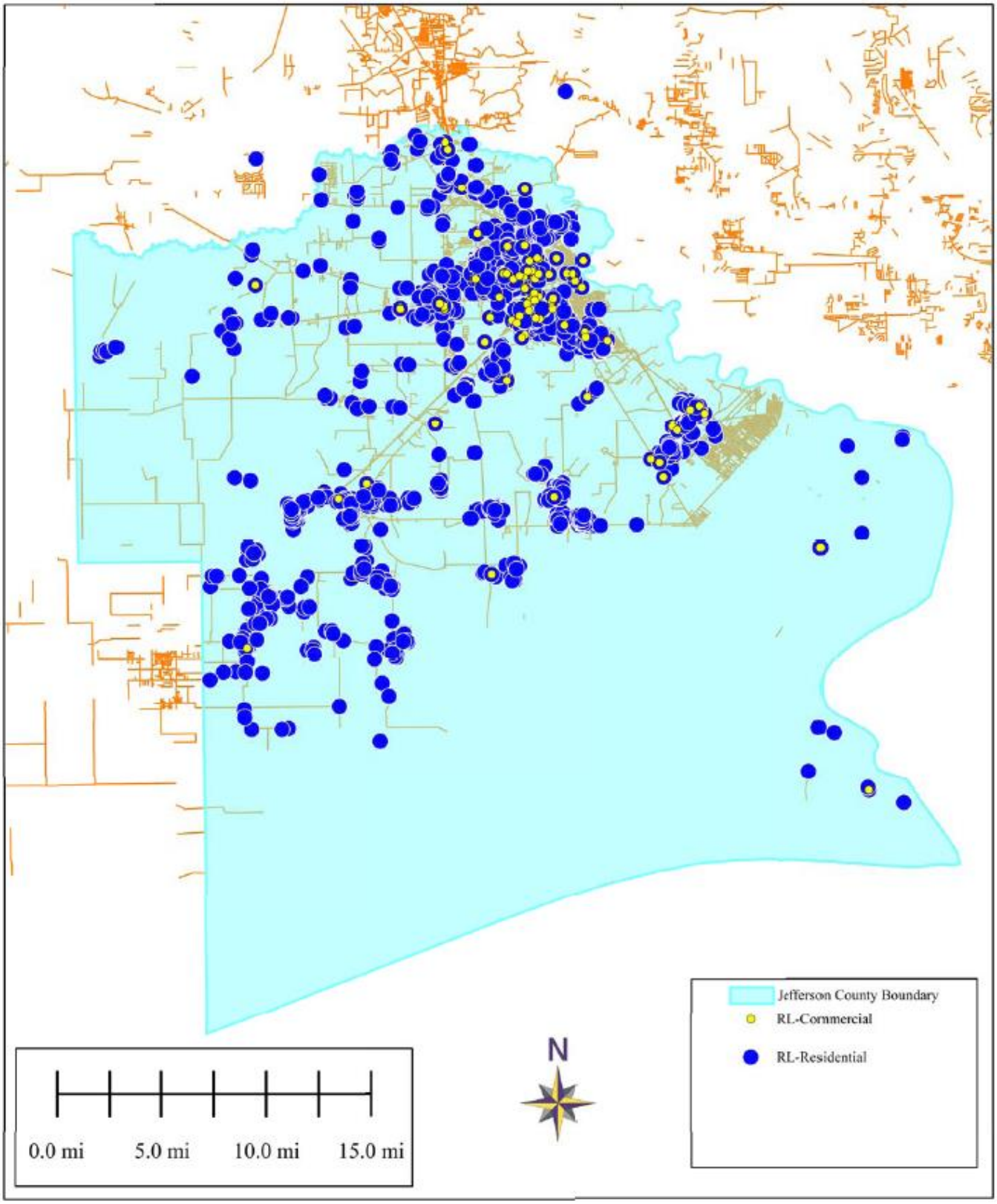
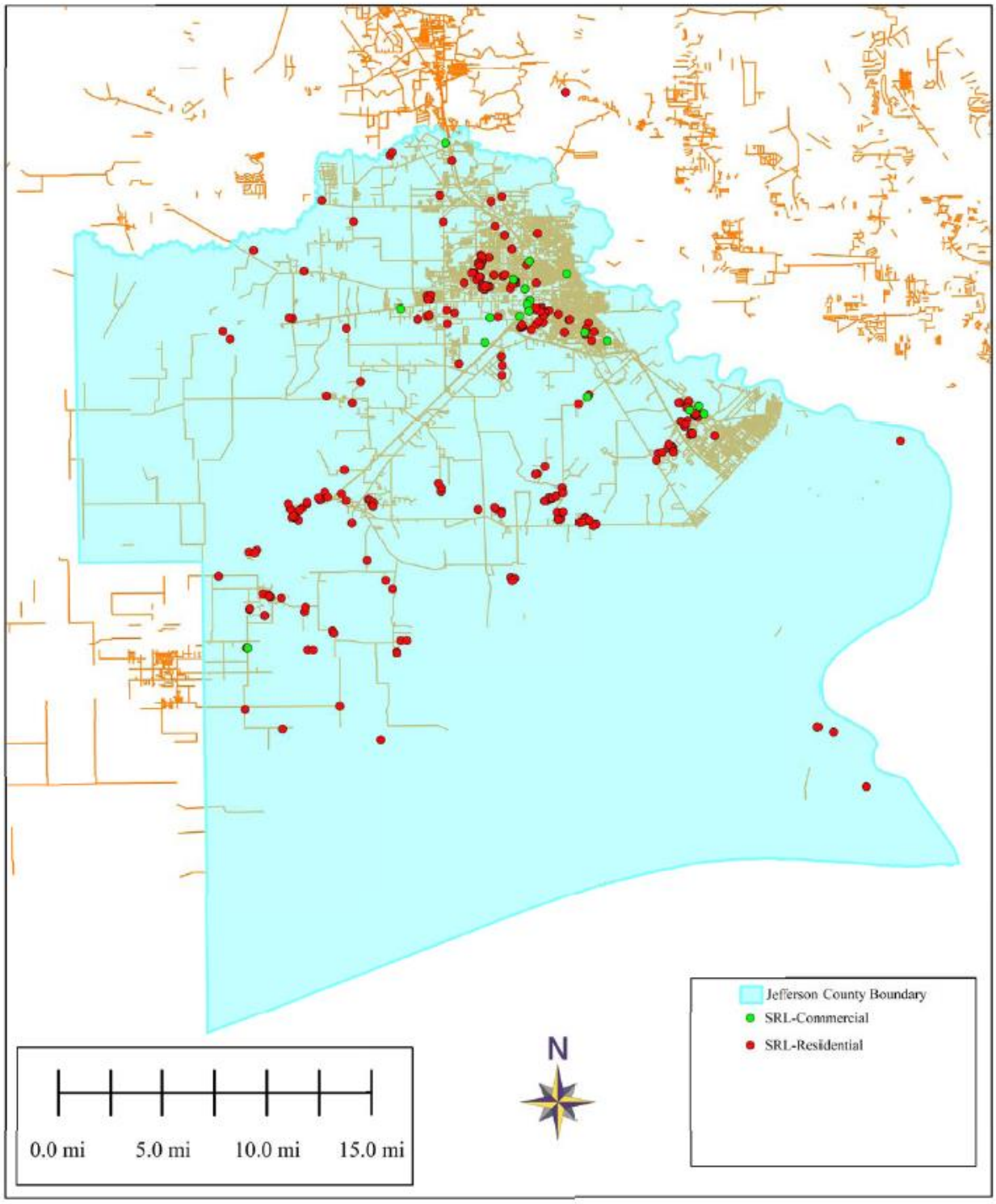


Figure Y – SRL Structures in Jefferson County



Hurricane and Tropical Storm

UPDATED FROM LAST PLAN

- Events since 2017 were updated and described.
- In addition, this section was formatted to explicitly address: Location, Previous Occurrence, Future Occurrence (Probability), and Extent. Also explicitly addressed are Impact and vulnerability summary.

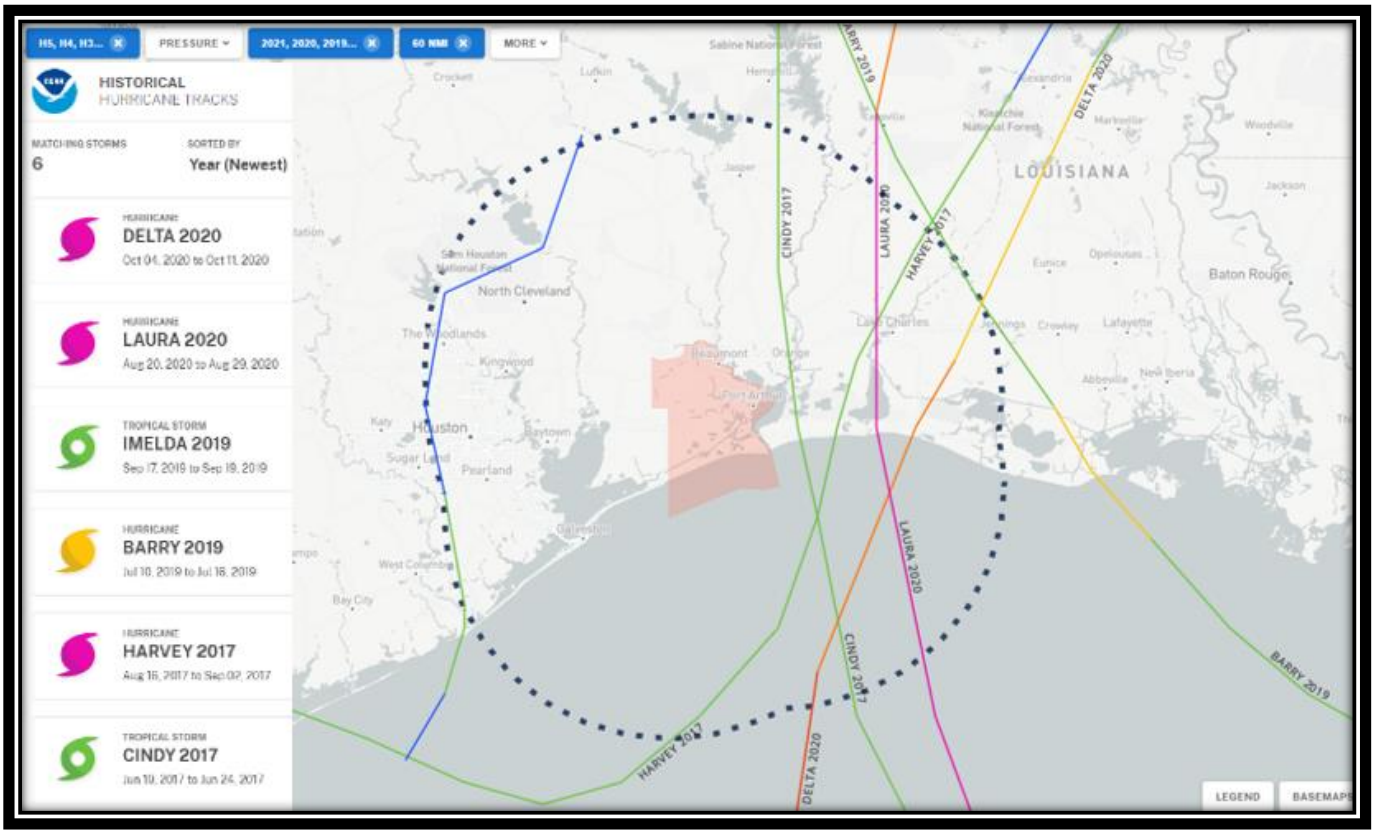
Hazard Description - Hurricane and Tropical Storm

A hurricane begins as a tropical depression with wind speeds below 39 mph. As it intensifies, it may develop into a tropical storm, with further development producing a hurricane. Hurricane winds blow in a large spiral around a relative calm center known as the "eye." The "eye", the storm's core, is an area of low barometric pressure and is generally 20 to 30 miles wide. The storm may extend outward 100 - 400 miles in diameter. As a hurricane approaches, the skies will begin to darken, and winds will grow in strength. As a hurricane nears land, it can bring torrential rains, high winds, storm surges, and severe flooding. A single hurricane can persist for more than 2 weeks over open waters and can run a path across the entire length of the Eastern Seaboard. August and September are peak months during the hurricane season that extends from June 1 through November 30.

Location

In JCDD6, located within close proximity to the Gulf of Mexico, the District is exposed to risk from hurricanes and tropical storms. Due to the widespread effects of hurricane and tropical storms, the entire planning area is affected equally. Since 1842 through 2021, there have been 36 Hurricanes and 40 Tropical Storms within 50 nautical miles of Jefferson County. Since the last version of the plan, there have been four hurricanes or tropical storms within 50 nautical miles of Jefferson County. Figure Z shows the location of JCDD6, indicated by the red arrow, and the paths of the four hurricanes and tropical storms that came within 50 Nautical Miles of the District since the last iteration of the plan (dotted black line). The geographic area affected by hurricanes and tropical storms is considered extensive.

Figure Z Historical Hurricane/Tropical Storm Tracks 2017-2021
(Source: NOAA Historical Hurricane Tracks)



Previous Occurrences

The NCEI Storm Events Database is limited to hurricane and tropical storm events from 1998 to 2021 so NOAA's Historical Hurricane Tracks was used. NOAA indicates that between 1842 and 2021 there were 36 hurricanes and 40 tropical storms within 50 miles of Jefferson County. The 37 events since 1950 are shown in the table 3-21 below.

Table 3-21 Hurricanes and Tropical Storms Jefferson County Drainage, 1950 - 2021
(Source: NOAA/NCEI)

Storm Name	Date Range	Max Wind Speed	Min Pressure	Max Category
DELTA 2020	Oct 04, 2020 to Oct 11, 2020	120	953	H4
LAURA 2020	Aug 20, 2020 to Aug 29, 2020	130	937	H4
IMELDA 2019	Sep 17, 2019 to Sep 19, 2019	40	1003	TS
BARRY 2019	Jul 10, 2019 to Jul 16, 2019	65	993	H1

Storm Name	Date Range	Max Wind Speed	Min Pressure	Max Category
HARVEY 2017	Aug 16, 2017 to Sep 02, 2017	115	937	H4
CINDY 2017	Jun 19, 2017 to Jun 24, 2017	50	991	TS
IKE 2008	Sep 01, 2008 to Sep 15, 2008	125	935	H4
EDOUARD 2008	Aug 03, 2008 to Aug 06, 2008	55	996	TS
HUMBERTO 2007	Sep 12, 2007 to Sep 14, 2007	80	985	H1
RITA 2005	Sep 18, 2005 to Sep 26, 2005	155	895	H5
IVAN 2004	Sep 02, 2004 to Sep 24, 2004	145	910	H5
GRACE 2003	Aug 30, 2003 to Sep 02, 2003	35	1007	TS
ALLISON 2001	Jun 05, 2001 to Jun 19, 2001	50	1000	TS
DEAN 1995	Jul 28, 1995 to Aug 02, 1995	40	999	TS
JERRY 1989	Oct 12, 1989 to Oct 16, 1989	75	982	H1
CHANTAL 1989	Jul 30, 1989 to Aug 03, 1989	70	984	H1
ALLISON 1989	Jun 24, 1989 to Jul 01, 1989	45	999	TS
UNNAMED 1987	Aug 09, 1987 to Aug 17, 1987	40	1007	TS
BONNIE 1986	Jun 23, 1986 to Jun 28, 1986	75	990	H1
JUAN 1985	Oct 26, 1985 to Nov 01, 1985	75	971	H1
DANNY 1985	Aug 12, 1985 to Aug 20, 1985	80	987	H1
ALICIA 1983	Aug 15, 1983 to Aug 21, 1983	100	962	H3

Storm Name	Date Range	Max Wind Speed	Min Pressure	Max Category
CHRIS 1982	Sep 09, 1982 to Sep 12, 1982	55	994	TS
DANIELLE 1980	Sep 04, 1980 to Sep 07, 1980	50	1004	TS
CLAUDETTE 1979	Jul 15, 1979 to Jul 29, 1979	45	997	TS
DEBRA 1978	Aug 26, 1978 to Aug 29, 1978	50	1000	TS
CARMEN 1974	Aug 29, 1974 to Sep 10, 1974	130	928	H4
DELIA 1973	Sep 01, 1973 to Sep 07, 1973	60	986	TS
EDITH 1971	Sep 05, 1971 to Sep 18, 1971	140	943	H5
FELICE 1970	Sep 12, 1970 to Sep 17, 1970	60	997	TS
ABBY 1964	Aug 05, 1964 to Aug 08, 1964	60	1000	TS
CINDY 1963	Sep 16, 1963 to Sep 20, 1963	55	996	TS
DEBRA 1959	Jul 22, 1959 to Jul 27, 1959	75	980	H1
BERTHA 1957	Aug 08, 1957 to Aug 11, 1957	55	998	TS
AUDREY 1957	Jun 24, 1957 to Jun 29, 1957	110	946	H3
UNNAMED 1955	Aug 25, 1955 to Aug 28, 1955	45	1004	TS
BARBARA 1954	Jul 27, 1954 to Jul 30, 1954	50	999	TS

Recent Significant Historic Events

Tropical Storm Allison (06/06/2001 – 06/09/2001): (Nearly 500 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over $12 M in payments). Tropical Storm Allison produced flooding throughout Southeast Texas, Louisiana, and across the eastern

United States. Damages were estimated at $5 Billion and prompted a Presidential disaster declaration for 30 counties in Texas.

Hurricane Rita (09/18/2005 – 09/26/2005) – Hurricane Rita made landfall just east of the Texas-Louisiana border. Along the coast of Jefferson County, storm surges near 10 feet occurred near Sabine Pass, where over 90 percent of the homes were severely damaged or destroyed. The storm surge backed up the Sabine River and flooded a small section of downtown Orange with around four to five feet of storm surge. High winds estimated at over 100 mph snapped and uprooting trees, and damaged over 125,000 homes and businesses.

Hurricane Ike (09/12/2008 – 09/13/2008): Ike delivered a 17.5-foot storm surge on Jefferson County's coastal plain and dropped anywhere from 6 to 20 inches of rain, depending on where in the County it was measured. The surge caused flooding in the county's sparsely developed coastal areas, though no flooding occurred as a result of heavy rain. In total, at least 4,000 homes were flooded in Jefferson County. Within JCDD6, the event caused no flood related property damages, mainly due to recently completed mitigation efforts.

Tropical Storm Harvey (08/25/2017 – 08/30/2017): Harvey made landfall as a category 4 Hurricane near Rockport, Texas on the evening of August 25th. The storm then weakened and slowed, looping back and tracking over SE Texas. Slow moving Tropical Storm Harvey produced torrential rains and catastrophic flooding in Jefferson County, causing an estimated $2 Billion in damages. Several tornadoes touched down. Major to record flooding occurred along the Brazos and San Bernard Rivers as well as the Neches River and Pine Island Bayou. Heavy rainfall in Jefferson County set records with a two-day maximum total of 35.7 inches and a four day maximum total of 48.8 inches. Flooding was especially severe in South Beaumont as well as Bevil Oaks. Over 4,500 homes were flooded within JCDD6. During Harvey, the District had 4 vehicles flooded. The vehicles were not located at the JCDD6 facility when they flooded. There was also damage to a dozer and excavator also located at a job site. Also, a conex at a job site with some supplies stored in it were damaged.

The only damage at the JCDD6 office was a gate motor that was damaged due to rising water at the entrance gate.

Tropical Storm Imelda (09/18/19) – The remnants of Imelda drifted slowly across the interior sections of Southeast Texas during the 18th. A very heavy band of rain dumped over 30 inches of rain in a 12-hour period which created extensive flooding across Jefferson County. The maximum storm total was 44.29 inches near Fannett. The first report of flooding was from the Jefferson County Sheriff's Department with major street flooding in the city of Beaumont and water was entering several homes. Due to the intense rate at which the rain fell flooding depth was worse than Harvey at some locations. Over 5,100 homes and businesses were flooded. Numerous high-water rescues were conducted throughout the county. Three people drowned in Jefferson County during the event, 2 men ran off the roadway and into a ditch in different events. Per a family press release, the other man was struck by lightning, but fell in the flood waters and drowned while attempting to save a horse. Drowning was considered the primary cause of death.

Future Probability
Because the effects of hurricanes and tropical storms are regional in nature, the events that impacted Jefferson County are assumed to have impacted JCDD6 as well. JCDD6 has experienced 76 hurricane and tropical storm events between 1842 and 2021. With 76 events reported over 179 years, a hurricane or tropical storm occurs approximately every two and a half years on average. Therefore, there is a 42% chance of a hurricane or tropical storm event affecting the planning area in any given year. The future occurrence is considered highly likely.

Magnitude/Extent
Tables 3-22 identify the criteria for each stage of development. The Saffir/Simpson Hurricane Scale (Table 3-23) is used to classify storms by numbered categories. Hurricanes are classified as Categories 1 through 5 based on central pressure, wind speed, and damage potential. Jefferson County Drainage District No. 6 can expect to experience a storm ranging from a tropical depression to a category 5 hurricane in the planning area. The maximum probable extent is considered extreme.

Table 3-22 Classification of Tropical Cyclones

Stage of Development	Criteria
Tropical Depression (development)	**Maximum sustained surface wind speed is < 39 mph**
Tropical Storm	**Maximum sustained wind speed ranges 39 - <74 mph**
Hurricane	**Maximum sustained surface wind speed 74 mph+**
Tropical Depression (dissipation)	**Decaying stages of a cyclone in which maximum sustained surface wind speed has dropped below 39 mph**

Table 3-23 Saffir/Simpson Hurricane Scale

Storm Category	Central Pressure	Sustained Winds	Potential Damage
1	> 980 mbar	74 - 95 mph	**Minimal**
2	965 – 979 mbar	96 - 110 mph	**Moderate**
3	945 – 964 mbar	111 – 130 mph	**Extensive**
4	920 – 944 mbar	131 – 155 mph	**Extreme**
5	**< 920 mbar**	**> 155 mph**	**Catastrophic**

Hurricane and Tropical Storm Impact
In JCDD6, hurricanes as severe as Category 5 have been experienced in the planning area. The type of impacts that can be expected are hurricane-force winds which drive rain into buildings causing water damage, downed trees, debris-blocked roads, disabled power lines, roof and mobile home damage. Hurricanes and tropical storms also bring heavy rains which have caused nearby creeks to exceed their capacity, inundating the surrounding area. The District can expect

to see tropical storms and hurricanes as severe as Category 5 causing extreme and even catastrophic damage in some cases.

Vulnerability

JCDD6's mission and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the effect of hurricanes and tropical storm winds on District owned facilities and personnel. JCDD6 built a 3,000 sq. ft. tornado and hurricane shelter built to house District Staff during a tornado or hurricane event, in accordance with FEMA 361 - Design and Construction Guidance for Community Shelters. JCDD6 also installed hurricane shutters on their administrative building and their engineering building.

Hurricane and tropical storm events have a very long warning time, so when an event is expected to hit, all employees will be evacuated other than essential personnel. That essential personal can easily stay within the hurricane shelter throughout the duration of an event. Even though District facilities and personnel are not vulnerable to hurricanes, based on our analysis, other District assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles totaling to $22,892,359 in insured value, may still have some risk of being damaged by hurricanes either while in storage or on project sites. However, the size and number of vehicles owned by the District make trying to protect all of them from hurricanes infeasible. JCDD6 closely monitors the weather and takes proactive steps, when possible, to move vulnerable equipment to higher ground when equipment is being operated or staged in a flood prone area.

Severe hurricanes and tropical storms have flooded thousands of homes, closed and damaged many roads throughout the District and damaged District buildings and equipment in the past. Several different areas within the District remain cause for concern among District, City and County officials. Flooded roads and debris accumulation from downed trees and damaged structures can impede emergency responders and hinder their timely response to calls for assistance. Additionally, utility interruption can occur from downed power lines causing an interruption in service to residents and critical infrastructure. This could degrade critical services and reduce or eliminate the ability of critical infrastructure to meet demand for service. The District works to keep ditches unimpeded and frequently applies for and administers grants to better control and reduce flooding within the District. When a hurricane or tropical storm is expected to impact the area, Jefferson County and Beaumont have warning systems in place to notify residents. The overall significance of hurricanes and tropical storms in the District is considered high.

Severe Thunderstorm High Wind
UPDATED FROM LAST PLAN

- Events since 2016 were updated and described.
- In addition, this section was formatted to explicitly address: Location, Previous Occurrence, Future Occurrence (Probability), and Extent. Also explicitly addressed are Impact and vulnerability summary.

Hazard Description

Thunderstorms are the by-products of atmospheric instability, which promotes vigorous rising of warm air. A typical thunderstorm may cover an area three miles wide. The National Weather Service (NWS) considers a thunderstorm "severe" if it produces tornadoes, hail of 0.75 inches or more in diameter, or winds of 58 miles per hour (50 Knots) or more. Structural wind damage may imply the occurrence of a severe thunderstorm. Thunderstorms/High winds affect the entire planning area.

Location - Severe Thunderstorm High Wind

Jefferson County is listed as Designated Catastrophe Area by the Texas Department of Insurance. The map below shows the "3-Second Gust Design Wind Speed" map from the Texas Department of Insurance according to the 2018 IBC. This map is used to design buildings to withstand reasonably anticipated winds in order to minimize property damage. The below figure shows the 3-second gust wind speeds at 33 ft. above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years). The blue marker shows the City of Beaumont. The District sits within the 122 – 149 and the geographic area affected is considered extensive.

Figure AA- 3-Second Gust Design Wind Speed
(Source: 2018 IBC Design Wind Speed for Risk Category II Buildings)

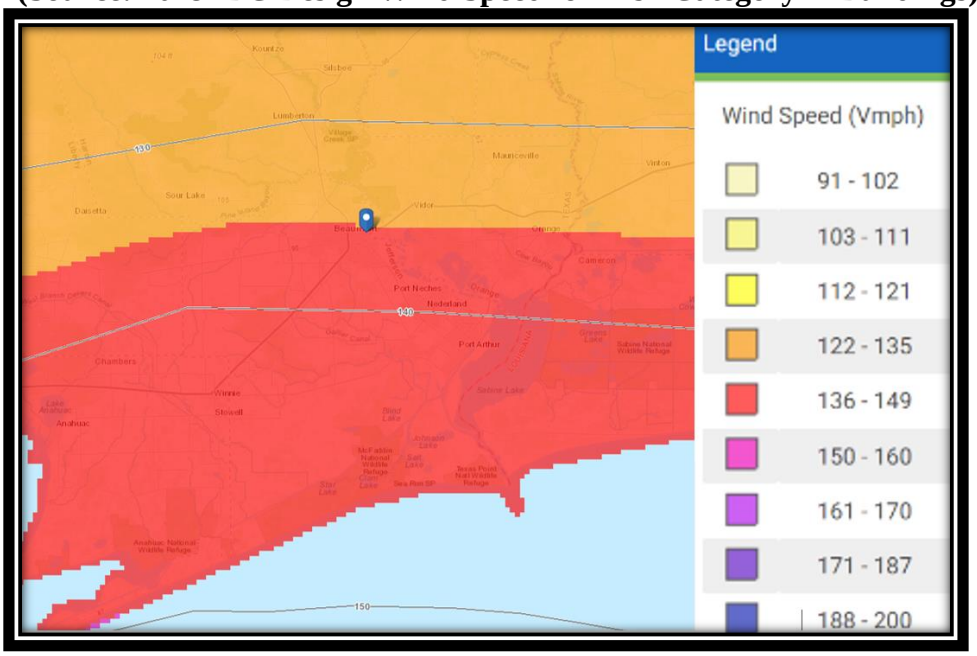
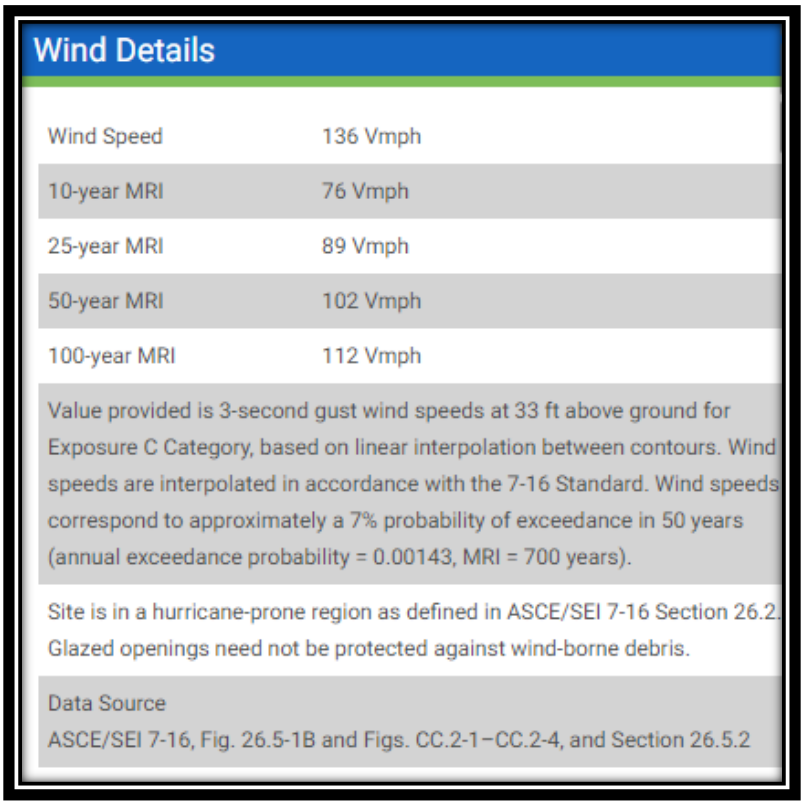


Figure AA (continued)



Wind Details

Wind Speed	136 Vmph
10-year MRI	76 Vmph
25-year MRI	89 Vmph
50-year MRI	102 Vmph
100-year MRI	112 Vmph

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Data Source
ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Previous Occurrences

The NCEI Storm Events Database only categorizes Thunderstorm events prior to 1993 by County, however, it has narratives and location maps describing the impacts of those events. The NCEI indicates that between 1993 and 2021 there were 47 High Wind events with property damage that impacted Jefferson County Drainage District No. 6. For these events, the NCEI database reported no fatalities or injuries and a total of $2,563,000 in damages. Table 3-24 summarizes the 10 events that have occurred in the District since the last version of this Plan.

Table 3-24 Severe Thunderstorm High Wind Events within JCDD6 2017 - 2021 (Source: NOAA/NCEI)

Location	Date	Type	Mag	Damage
BEAUMONT	12/19/2020	Thunderstorm Wind	50 kts. EG	$20,000.00
AMELIA	8/5/2020	Thunderstorm Wind	50 kts. EG	$15,000.00
CHINA	5/28/2020	Thunderstorm Wind	50 kts. EG	$4,000.00
GUFFEY	5/9/2019	Thunderstorm Wind	60 kts. EG	$1,000,000.00

Location	Date	Type	Mag	Damage
BEVIL OAKS	4/7/2019	Thunderstorm Wind	50 kts. EG	$10,000.00
JEFFERSON (ZONE)	12/26/2018	Strong Wind	39 kts. EG	$5,000.00
GUFFEY	4/14/2018	Thunderstorm Wind	96 kts. EG	$400,000.00
(BPT)BEAUMONT-PT ART	6/24/2017	Thunderstorm Wind	50 kts. EG	$10,000.00
AMELIA	3/29/2017	Thunderstorm Wind	50 kts. EG	$8,000.00
PINE CREST	2/20/2017	Thunderstorm Wind	50 kts. EG	$10,000.00
				$1,482,000.00

Most of these events with property damage reported caused downed trees and, in some cases, downed powerlines. Only two events since the last version of the Plan caused over $25,000 in damage. Those events are described below:

4/14/2018 – At Lamar University, strong winds uplifted and peeled back a large portion of the University Police station and toppled several large trees. A glass wall and several windows were also blown in. On Oregon Ave, the exterior brick wall of an apartment building collapsed. Max estimated wind gusts were between 105 and 110 MPH. Damage is estimated at $400,000.

5/9/2019 – A dock crane was blown over into the Neches Ship Channel. A large salvage crane also broke loose.

Though neither of these events impacted District facilities or assets, these events were within the District.

Future Probability

Jefferson County Drainage District No. 6 has experienced 10 high wind events between 2017 and 2021, causing an estimated $1.482 million in property damage. Similarly, since 1993, there have been 47 events. Calculations involving 10 events reported over 5 years, and 47 events reported over 29 years suggest a high wind event can be expected every year on average. Though a high wind event does not happen every year, some years contain multiple events, and the District should expect to see high wind events in any given year. Future probability is considered highly likely.

Magnitude/Extent

The most widely accepted descriptive wind scale is the Beaufort Wind Scale shown in Table 3-25. The table below described the force of the storm and the wind speed, classification and appearance that is associated with each wind force. In the planning area JCDD6 can expect to experience wind events ranging from light winds to hurricane force winds. The maximum probable extent is considered extreme.

Table 3-25 Beaufort Wind Scale (Source: NOAA)

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted; small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft., white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (18-25 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft.), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft.) with overhanging crests, sea white with densely blown	Seldom experienced on land, trees broken or

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
			foam, heavy rolling, lowered visibility	uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft.) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

Impact

In JCDD6, though there are extreme events, most wind damage has been limited to downed trees, debris-blocked roads, and disabled power lines with the occasional roof and mobile home damage. Jefferson County Drainage District No. 6 has experienced several severe thunderstorms and high winds up to 50 Knots and one event measured at 96 Knots. Similar events could affect JCDD6 in the future. The type of impacts that can be expected are associated with the magnitudes from the Beaufort Wind Scale, which indicate storms as severe as a "Hurricane force wind" extent, involving trees being broken or uprooted along with considerable structural damage. The maximum probable extent is considered extreme.

Vulnerability

According to the NCEI, there have been 22 severe thunderstorm and high wind events with winds over 50 Knots within JCDD6. JCDD6's missions and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the effects of severe thunderstorms and high wind on District owned facilities and personnel. JCDD6 built a 3,000 sq. ft. tornado and hurricane shelter built to house District Staff during a tornado or other high wind event, in accordance with FEMA 361 - Design and Construction Guidance for Community Shelters. JCDD6 also installed hurricane shutters on their administrative building, their engineering building, and their shelter building. Between these three buildings, all District staff can remain inside and safe during a severe thunderstorm or high wind event. The District also plans to periodically perform engineering and structural surveys on JCDD6 facilities (e.g., command and control facilities) to ensure that they are sufficiently protected from effects of hazards. High wind can also down trees and limbs which can block ditches or damage equipment and in certain storms, exacerbate flooding. The District monitors equipment and clears ditches as soon as possible to prevent or reduce further damages in these events. Other District assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles totaling to $22,892,359 in insured value, may have some risk of being damaged by severe thunderstorms and high winds either while in storage or on project sites. However, the size and number of vehicles owned by the District make trying to protect all of them from severe thunderstorms and high winds infeasible. The overall significance of high wind events is considered high.

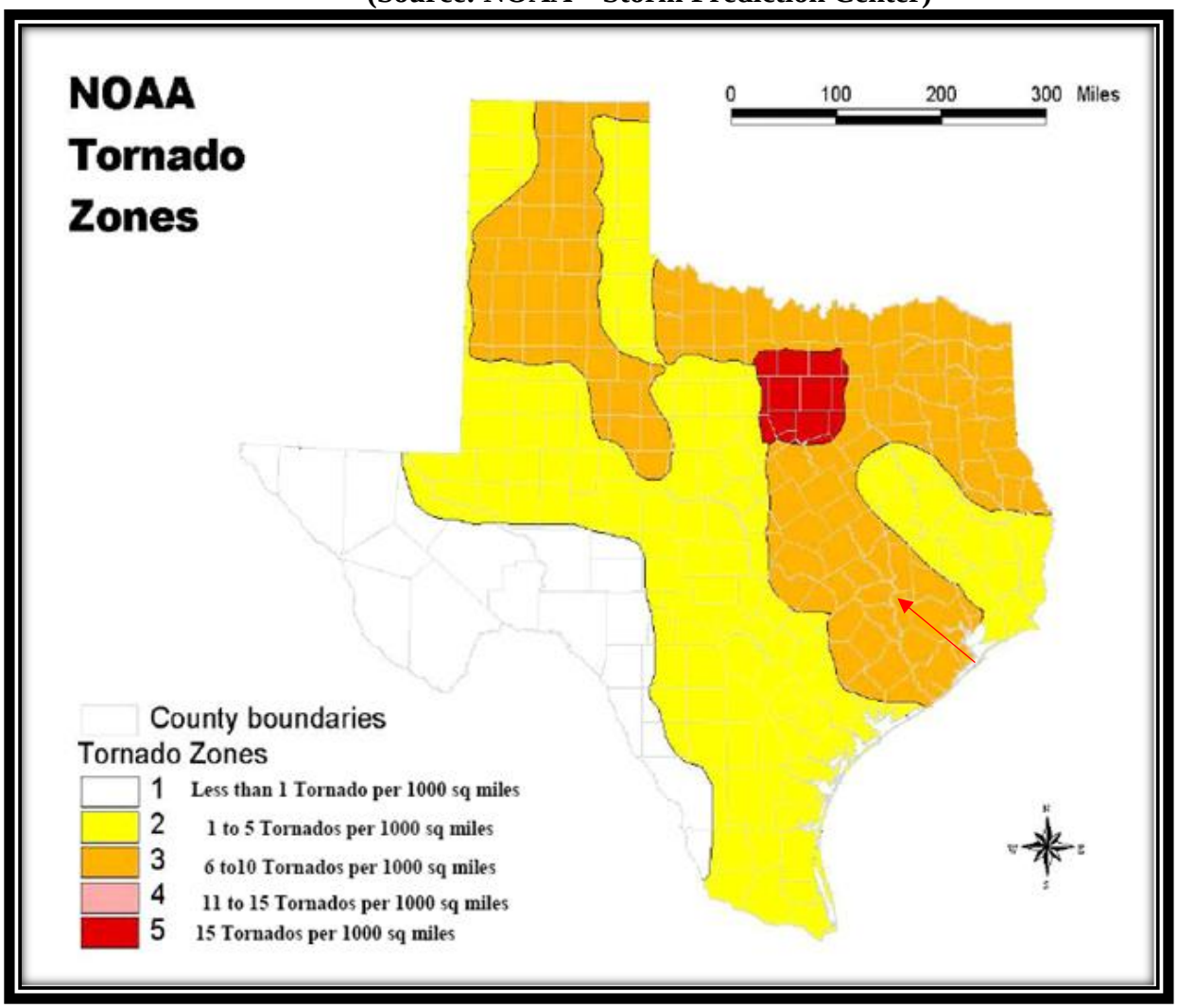
Tornadoes
UPDATE FROM LAST PLAN

- Events since 2016 were updated and described.
- In addition, this section was formatted to explicitly address: Location, Previous Occurrence, Future Occurrence (Probability), and Extent. Also explicitly addressed are Impact and vulnerability summary.

Hazard Description
The National Weather Service defines a tornado as a violently rotating column of air in contact with the ground and extending from the base of a thunderstorm. Tornadoes can form any time of the year; but the season of greatest activity extends from March to August.

Location - Tornadoes
Figure BB illustrates the frequency of tornado strikes in Texas per 1,000 square miles, the arrow denotes the approximate location of JCDD6, which falls within the zone for 1-5 tornadoes in a 1,000 square mile per the NOAA Prediction Center Map. While tornadoes can occur in any month in Texas and at all hours of the day or night, they occur with greatest frequency during the late spring and early summer months, during late afternoon and early evening hours. There is some potential for the full range of tornadoes (from EF-0 to EF5) to impact most areas of Texas, including JCDD6, although events at the lesser end of the scale are much more likely. Northern Texas is most vulnerable, but the area around JCDD6 experiences considerable activity. The tornado hazard affects the entire planning area approximately equally. All structures in the District are vulnerable to the effects of tornadoes (particularly tornadoes at the more intense end of the Enhanced Fujita scale). However, highly engineered commercial (and other non-residential) structures are typically less vulnerable to the effects of tornadoes than are residential structures, with some exceptions. The geographic area affected from tornadoes is considered limited.

Figure BB - Tornado Activity in Texas
(Source: NOAA – Storm Prediction Center)



Previous Occurrences

The NCEI Storm Events Database only categorizes tornado events prior to 1993 by County, however, it has narratives and location maps describing the impacts of those events. The NCEI indicates that between 1959 and 2021, Jefferson County experienced 104 tornados, however some were reported multiple times in the database or multiple tornadoes occurred as a part of the same storm. However, looking at the narratives, there were 28 tornado events that impacted Jefferson County Drainage District No. 6. For these events, the NCEI database reported no fatalities and 27 injuries and a total of $27,902,500 in damages. Two tornadoes occurred in the planning area since that last version of the Plan, but neither caused any damage. Table 3-26 summarizes the 11 tornadoes that have occurred in Jefferson County Drainage District No. 6, causing at least $50,000 in damage.

Table 3-26 Tornadoes within Jefferson County Drainage District No. 6, 1950 - 2019 (Source: NOAA/NCEI)

Location	Date	Mag	Dth	Inj	Property Damage	Description
JEFFERSON CO.*	10/28/1974	F2	0	3	$ 250,000.00	Tornado touched down destroying service station and injuring three persons with flying debris. Some damage to roofs and sheds in the area.
JEFFERSON CO.*	10/22/1979	F2	0	0	$2,500,000.00	Roofs of some 65 commercial storage bins were removed. Skimmed ground level though a residential area; 7-10 homes were damaged.
JEFFERSON CO.*	9/5/1980	F1	0	0	$ 250,000.00	No description available
JEFFERSON CO.*	4/23/1981	F2	0	2	$ 250,000.00	No description available
JEFFERSON CO.*	1/31/1983	F3	0	1	$2,500,000.00	No description available
NOME	1/1/1999	F3	0	5	$ 500,000.00	A strong tornado that developed in Liberty County moved into western Jefferson County, destroying several rice dryers, two mobile homes, and a brick house. Five people were injured in the mobile homes and brick house. Two people received broken necks and other injuries after they were ejected from one of the mobile homes. This tornado was strongest southwest of Nome and was weakening as it passed through Nome. At least 20 homes received minor damage such as shingles blown off, and many trees were blown down.
BEAUMONT	10/13/2001	F1	0	0	$ 1,000,000.00	A tornado touched down near Cardinal Drive and damage several warehouses and businesses, before hitting a school gym.
BEAUMONT	11/18/2003	F0	0	0	$ 100,000.00	A small tornado touched down briefly in Beaumont, damaging the overhead door of a business and several cars in the parking lot.
CHINA	10/16/2006	F1	0	0	$ 300,000.00	A tornado destroyed 5 mobile homes and damaged an additional 20 homes just east of China. Trees and power lines were blown down.

Location	Date	Mag	Dth	Inj	Property Damage	Description
GILLBURG	8/18/2009	EF1	0	10	$20,000,000.00	An EF1 Tornado touched down just west of the Kohl's Department Store in the Parkdale Mall area. The tornado struck the Kohl's, tearing off part of its roof and collapsing the front entrance. The tornado continued to the northeast and crossed a Walmart parking lot, flipping over four vehicles and damaging dozens of others. Further to the northeast, the tornado struck Parkdale Mall, damaging the roofs of several department stores. The tornado lifted in the east parking lot of Parkdale Mall before reaching Highway 69.
NOME	6/9/2010	EF1	0	0	$ 100,000.00	A low-end EF1 tornado struck the eastern part of Nome. In total, a Red Cross survey found up to 30 homes suffered some degree of damage, and of those 2 were considered destroyed and 3 had major damage. Dozens of trees and power lines were blown down all along the path in all different directions. No injuries were reported.
Totals:			0	21	$27,750,000.00	

*Events prior to 1993 are matched from narratives and locations found in the historical Storm Data Publication.

The NCEI database is not complete but continues to add more information which makes the historic events reported for just Jefferson County Drainage District No. 6 more accurate. There was one other event in 1962 that is shown to have six injuries near the City of Beaumont and no property damage, but no description is available.

Future Probability

Jefferson County Drainage District No. 6 has experienced 28 tornadoes between 1959 and 2021, causing an estimated $27,902,500 in property damage. These 28 tornado events were assessed as 13 F0 and EF0 tornadoes, with nine assessed as F1 and EF1s, four assessed as an F2 and two assessed as F3s. Calculations based on 28 events reported over 62 years suggest Jefferson County Drainage District No. 6 experiences a tornado event approximately every 2.2 years on average, though less than half are considered severe. Therefore, there is a 45% chance of a tornado event and a 17.7% chance of a severe tornado event in any given year. The probability of future events is considered likely.

Magnitude/Extent

Tornado damage severity is measured by the Enhanced Fujita Tornado Scale (EF-Scale). The Enhanced Fujita Scale assigns numerical values based on wind speed and categorizes tornadoes from zero to five representing increasing degrees of damage. Tornadoes are related to larger vortex formations, and therefore often form in convective cells such as thunderstorms or in the right forward quadrant of a hurricane or tropical storm, far from the hurricane eye. Table 3-27

describes the categories for the Enhanced Fujita Tornado Scale. JCDD6 can expect to experience a tornado ranging from EF0 to EF5 in the planning area, though the most severe event the District has experienced is an F3. The maximum probable extent is considered severe.

Table 3-27- The Enhanced Fujita (EF) Scale

Enhanced Fujita (EF) Scale		
Enhanced Fujita Category	**Wind Speed (mph)**	**Potential Damage**
EF0	65-85	**Light damage.** Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	**Moderate damage.** Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	**Considerable damage.** Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	**Severe damage**. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	**Devastating damage**. Well-constructed houses and whole frame houses completely leveled; cars thrown, and small missiles generated.
EF5	>200	**Incredible damage**. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd.); high-rise buildings have significant structural deformation; incredible phenomena will occur.

Impact

In JCDD6, most wind damage has been limited to downed trees, blocked roads, and disabled power lines with the occasional roof damage. Historically, Jefferson County Drainage District No. 6 has experienced tornadoes limited to EF0-F3 strength. The type of impacts that can be expected are associated with those magnitudes from EF0-EF3 described below:

- EF0-Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
- EF1-Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.

- EF2-Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
- EF3-Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.

Vulnerability

According to the NCEI, there have been 28 tornadoes within Jefferson County Drainage District No. 6, including 13 F0 and EF0 tornadoes, with nine F1 and EF1s, four F2s and two F3s. Mobile and manufactured homes are the most susceptible to tornado damage as they can be easily displaced or overturned in high winds. JCDD6's mission and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the effects of severe thunderstorms and high wind on District owned facilities and personnel. JCDD6 built a 3,000 sq. ft. tornado and hurricane shelter built to house District Staff during a tornado or other high wind event, in accordance with FEMA 361 - Design and Construction Guidance for Community Shelters. JCDD6 also installed hurricane shutters on their administrative building and their engineering building. Between these three buildings, all District staff can remain inside and safe during a tornado event if there is enough warning. The District also plans to periodically perform engineering and structural surveys on JCDD6 facilities (e.g., command and control facilities) to ensure that they are sufficiently protected from effects of hazards. Tornadoes also frequently down trees and limbs which can block ditches or damage equipment and in certain storms, exacerbate flooding. The District monitors equipment and clears ditches as soon as possible to prevent or reduce further damages in these events. Other District assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles totaling to $22,892,359 in insured value, may have some risk of being damaged by severe thunderstorms and high winds either while in storage or on project sites. However, the size and number of vehicles owned by the District make trying to protect all of them from severe thunderstorms and high winds infeasible. The overall significance of tornado events is considered high.

Severe Winter Weather
UPADATE FROM LAST PLAN

- Events since 2016 were updated and described.
- In addition, this section was formatted to explicitly address: Location, Previous Occurrence, Future Occurrence (Probability), and Extent. Also explicitly addressed are Impact and vulnerability summary.

Hazard Description –Severe winter weather includes heavy snow and blizzards, sleet, ice storm (or freezing rain), frost/freeze or a mix of these. Severe winter weather can down trees, cause widespread power outages, damage property, and cause fatalities and injuries. The effect of severe winter storms on Texas is quite disruptive compared to other regions that normally experience severe winter weather. Winter storms can result in flooding, storm surge, closed highways, blocked roads, downed power lines and hypothermia. Extreme cold that often accompanies severe winter storms can also be independent of a storm.

A heavy snowfall for the state is an accumulation of four or more inches of snow in a 12-hour period. This amount of snow accumulation usually occurs in the northern half of the State and in the higher elevations of West Texas and is rare in the District.

Blizzards are the most perilous of all winter storms, characterized by low temperatures and strong winds in excess of 35 mph, bearing large amounts of blowing or drifting snow. Blizzards take a terrible toll in livestock and people caught in the open. In Texas, blizzards are most likely to occur in the Panhandle and South Plains Regions and are rare in the District.

An ice storm occurs when rain falls out of the warm upper layers of the atmosphere into a cold and dry layer near the ground. The rain freezes on contact with the cold ground and accumulates on exposed surfaces. Damage can occur with half an inch of rain freezing on trees and utility wires; the damage increases if there are high winds. Based on this, an icing event is categorized an ice storm at half an inch.

Location
Although winter storms in Texas occur less frequently than they do further north, they occur often enough to be considered a viable, seasonal threat. Texans are most familiar with four types of winter storms: snowstorms, blizzards, cold waves and ice storms. In Jefferson County Drainage District No. 6, Texas snowstorms, cold waves and ice storms are most common. Generally, the winter storm season in Texas runs from late November to mid-March, although severe winter weather has occurred as early as October and as late as May in some areas. Within Jefferson County Drainage District No. 6, the risk to people and property from winter weather cannot be distinguished by area; the hazard is reasonably predicted to have uniform probability of occurrence across the entire District. All people and assets are considered to have the same degree of exposure. Figure CC shows the average annual snowfall totals for the United States. The map shows southeastern Texas receives less than eight inches of snow per year. The geographic area affected is considered significant.

Figure CC - United States Average Annual Snowfall Map

Previous Occurrence

For Jefferson County as a whole the NCEI reports there have been three winter storm and ice storm events between 1950 and 2021. Although the query results begin in 1950 the first reported event is in 1997. For these three events, the NCEI database reported one fatality and 10 injuries and a total of $10,010,000 in damages. One event occurred in the planning area since that last version of the Plan. No damages were reported, but the 2021 event cause one death. Table 3-28 summarizes the three winter and ice storm events that have occurred in Jefferson County Drainage District No. 6.

Table 3-28 Winter Storms and Ice Storms within Jefferson County 1950 - 2021 (Source: NOAA/NCEI)

Location	Date	Type	Dth	Inj	PrD	
JEFFERSON (ZONE)	1/12/1997	Ice Storm	0	10	10.000M	A record ice storm paralyzed southeast Texas and southwest Louisiana. Around 90,000 electric customers across southeast Texas were without power for up to six days. Emergency shelters were opened for several nights due to the cold weather following the ice storm. More trees and power lines were knocked down in this ice storm than what came down during Hurricane Bonnie in 1986. Hundreds of homes received minor damage due to trees or tree limbs falling on roofs. Several house fires were directly or indirectly related to the ice storm, but fortunately there were only no

Location	Date	Type	Dth	Inj	PrD	
						injuries. Numerous traffic accidents attributed to icy roads led to several minor injuries. One death was indirectly attributed to the ice storm. Two men were electrocuted on Tuesday, January 21st, while doing cleanup work for a local electric company. One 48-year-old man died, and a 19 year old man was seriously injured in the accident.
JEFFERSON (ZONE)	12/11/2008	Winter Storm	0	0	0.00K	A cold upper-level low pressure system moved across Southeast Texas late on December 10, 2008 into the morning hours of December 11, 2008. As cold air aloft associated with this system interacted with widespread rainfall ongoing over the area, precipitation began mixing with sleet and snow, and eventually changed over to all snow in many locations. This rare snow event lasted from 5 to 7 hours, with numerous reports of large snowflakes to the size of half dollars, along with a few reports of thunder snow. Snow totals ranged from a trace or less across far northern areas of southeast Texas and along the coast, to over 5 inches in western Hardin and Jefferson counties.
JEFFERSON (ZONE)	2/14/2021	Winter Storm	1	0	0.00K	Temperatures fell through the afternoon and evening across Jefferson County as showers developed. Rain turned to freezing rain during the evening and then quickly over to sleet. Light snow mixed in by the end of the event. Accumulations ranged from around half an inch on the coast to near 2 inches north of Beaumont. Bridges and overpasses became iced and closed. Most roads were hazardous. A 65-year-old man in Labelle died from hypothermia due to exposure.
Totals:			1	10	10.010M	

Future Occurrence
Future probability is based in part on historical data. Given that there are only three recorded events since 1996, the District can expect a winter storm or ice storm event once every 8.6 years on average. There is about a 12% chance of the District experiencing a winter storm or ice storm in any given year. The probability of future event is considered likely.

Magnitude/Extent
Jefferson County Drainage District No. 6's subtropical climate makes snow accumulation rare. However, the Gulf of Mexico provides the moisture source when a strong Arctic cold front brings below freezing temperatures to southeastern Texas. When conditions are right, warmer moisture-laden air overrides the below-freezing temperatures near the surface and freezing rain and sleet result, creating ice to accumulate. Using the Sperry-Piltz Ice Accumulation Index (SPAI Index), Jefferson County Drainage District No. 6 planning area could expect to fall within a 0-3 ice damage index range. The maximum probably extent is considered moderate.

Figure DD – SPAI Index

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Impact

Winter storms in Texas, although not as numerous or severe as in the northern States, do occur and with sufficient severity to be a minor threat to people and property. Extreme cold temperatures are generally minimal in the area, with effects mainly limited to humans, although occasionally there may be relatively minor effects on infrastructure such as freezing pipes or electrical grids. Winter storms may place any and all residents within the District at risk of injury or death during any given occurrence. During extreme weather conditions, elderly persons, small children and infants and/or the chronically ill who do not have adequate heating in their homes may become more vulnerable to injury or death. Many homes in the area have inadequate cold-weather pipe protection, so are at a greater risk of freezing and bursting water pipes when the outdoor temperature drops to 20°F. Jefferson County Drainage District No. 6 is in a climatic region that is unlikely to experience snow depths sufficient to cause significant property damage such as collapsed roofs.

Vulnerability

According to the NCEI, there have been three winter storm and ice storm events within JCDD6. JCDD6's missions and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the effects of winter storms and ice storms on District owned facilities and personnel. JCDD6 facilities are built to withstand freezing temperatures and protect District staff and property. The District also plans to periodically perform engineering and structural surveys on JCDD6 facilities (e.g., command and control facilities) to ensure that they are sufficiently protected from effects of hazards. Severe winter weather can also down trees and limbs which can block ditches or damage equipment and in certain storms, exacerbate flooding. The District monitors equipment and clears ditches as soon as possible to prevent or reduce further damages in these events. The overall significance in the District is considered medium, but the District's vulnerability is considered low.

Analyze Risk

Once establishment of the hazard areas, extent, impact and probability are complete and community assets identified, analysis can be conducted to identify where community specific vulnerabilities and problem areas exist. In addition to this information, Community Assets were also reviewed. Throughout this process, the District updated critical infrastructure list to better assess what, exactly, is at risk. Using this information and the most recent experience of Hurricanes/Tropical Storms Harvey and Imelda, the District ranked the hazards and developed actions to mitigate those hazards.

Hazard rankings were based on the impact to assets and hazard analysis. Hazards were ranked using a high, medium, or low ranking, defined as follows:

Low	Unlikely to occur in area and impact is negligible
Medium	Likely to occur in area, with moderate impact
High	Highly likely to occur in area and impact could cause significant damage including fatalities

Summarize Vulnerability

Once establishment of the hazard areas, extent, impact and probability are complete and community assets identified, analysis can be conducted to identify where community specific vulnerabilities and problem areas exist. Using this information, the District ranked the hazards and developed actions to help mitigate those hazards. The ranking list is in Table 3-29.

Table 3-29 Hazard Ranking

Hazard	Rank (HIGH MEDIUM LOW)
Hurricane/Tropical Storms	High
Flood	High
Tornado	Medium
Thunderstorms/High Wind	Medium
Dam Failure	Medium
Drought/Extreme Heat	Low
Severe Winter Weather/Winter Storm	Low

Section 4 – MITIGATION STRATEGY

Update from Last Plan

- Removed detailed section of FEMA and State of Texas Goals
- Updated mitigation goal and included Mitigation strategy
- Provided the status of the actions in the approved 2016 plan. The on-going actions were placed into the current hazard mitigation table and rank reassessed.
- Reformatted the Mitigation Action Table

Mitigation Strategy

As the State of Texas 2018 Hazard Mitigation plan emphasized, hazard mitigation planning pays off and having a strategy and plan is key to that success.

Texas is the number one disaster state in the country. Investing in hazard mitigation is critical to reducing the impacts of natural disasters such as hurricane Harvey. According to the Pew Charitable Trusts, in 2005, research by a group of independent experts found that for every dollar invested in actions to reduce disaster losses, the nation saves about $4 in future costs, in 2011, FEMA mitigation programs helped communities in U.S. by providing $252 million in grants for flood mitigation. FEMA estimates that the mitigation projects implement from that funding will stave off approximately $502 million in potential flood-related losses. Development a smart mitigation plan to apply for FEMA's Hazard mitigation grant program is a best practice for long-term mitigation strategy.

State of Texas Hazard Mitigation Plan, October 2018)

JCDD6 has developed a range of policies, programs and procedures to serve as a framework for its hazard mitigation strategy, the long-term blueprint for reducing the potential losses identified in the risk assessment. Strategies include daily operations that contribute to reducing the impact of future hazards as well as specific hazard mitigation projects. The JCDD6 mitigation planning strategy is to:

- Develop and maintain a comprehensive understanding of risks in its jurisdictional responsibility
- Develop and pursue hazard mitigation funding opportunities
- Implement cost-effective hazard mitigation projects
- Ensure that citizens are informed about the potential effects of natural hazards
- Seek additional ways to integrate hazard mitigation into all schedules (maintenance, mowing as examples) plans and projects

The first step of the mitigation strategy involved review of the current plan's mitigation goal, to assess whether it remains reflective of the District's mitigation strategy. The MPC also reviewed the State's goals from their 2018 update. While much of the goals is still relevant, the MPC further refined the statement to make those goals more concise and centric to hazard mitigation. The updated mitigation goal is as follows:

Mitigation Goal

The creation of the Jefferson County Drainage District No. 6 ("the District") was to make drainage improvements in the jurisdictional boundaries it serves. This role was further expanded as a conservation and reclamation District allowing the District to further conserve the natural resources of the State and help to mitigate health and safety hazard. The continuing mission of the District is to provide flood damage reduction projects that work with appropriate regard for community and natural values. It is this mission and aligning this mission to the State's goals that drives the goals.

Therefore, the goal of this plan is to support the District's efforts to protect the community's health, safety, and welfare by identifying and increasing public awareness of natural hazards and mitigating risks due to those hazards without creating new problems. In addition, The District will work to:

- Protect public health, safety, and welfare and natural resources.
- Reduce losses due to hazards by identifying hazards, minimizing exposure of citizens and property to hazards, and increasing public awareness and involvement.
- Facilitate the development review and approval process to accommodate growth in a practical way that recognizes existing stormwater and floodplain problems while avoiding creating new problems or worsening existing problems.
- Reduce adverse environmental, natural resource, and economic impacts from natural, hazard events; and
- Increase cooperation and coordination among private entities, local agencies, State agencies and Federal agencies

Status of Actions from the Current Approved Mitigation Plan

The approved 2017 plan distinguished actions by classifying them as high, medium and low priorities using the STAPLEE criteria and defined as:

- High: Meets five of the seven STAPLEE criteria
- Medium: Meets four of the seven STAPLEE criteria
- Low: Meets three of the seven STAPLEE criteria

There were 27 action items. There were twenty-two high (or high/medium) priorities, four medium priorities and one low priority. Eight of those actions have either been completed or removed. The remaining actions were reassessed and re-prioritized with the new 2022 actions. Table 4-1 provides the actions from the current plan, status, issues, and funding. It also provides the recommendation: Completed, Remove or Move to New Actions.

Table 4-1 - Status of Actions from 2017 Plan

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
Mitigation Action No. 14 – (2012) Enhance DD6's internal GIS capabilities. The District has been researching the best, most cost-effective way to enhance its GIS capabilities and has purchased approximately $20,000.00 worth of scanner and computer equipment to scan maps and begin the GIS database. They are currently researching programs and hardware options. Hazard(s) Addressed: Flood and Hurricanes/Tropical Storms Priority: High Estimated Cost: $20,000-$50,000	Update: GIS capabilities in place for DD6 for right of way inventory used for projects. In addition, there is interactive mapping information on website for users. While not complete, GIS capabilities have been enhanced for internal and public consumption. Issues: Technology dictates this item being updated regularly and therefore will always be an action. Recommendation: Work is ongoing. Will move to 2021 Actions.
Mitigation Action No. 15 - E (2012) Green Pond Gully Drainage Project Ditch 600 needs to be widened in order to convey the flood flows delivered by the fields and tributaries, and the crossings need to be replaced with longer bridges that are constructed up and out of the flood flows. Hazard(s) Addressed: Flood Priority: High Estimated Cost: $13,500,000	Update: COMPLETE Issues: NONE Recommendation: Will be removed in next plan and not include in action prioritization.
Mitigation Action No. 16 – (2012) Create severe weather action plan, conduct drills, identify and promulgate evacuation and sheltering options. Hazard(s) Addressed: Flood Priority: Low Estimated Cost: Cost of labor and equipment to run drills and assessments.	Update: Ongoing – District has organized itself into maintenance zones, where there are a pre-assigned locations for running debris and drift. No drills established but a notification system is in place that is tested regularly to ensure all employees are current and receiving necessary information. Issues: No longer pursuing in short term Recommendations: Will keep action but moved to a low priority

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
Mitigation Action No. 17 - Increase coordination with the City and County regarding flood predictions and post event recovery work. Hazard(s) Addressed: Flood Priority: High Estimated Cost: $0,000,000	Update: The District meets weekly with the City of Beaumont and is a member of a team with the County which prior to any disaster makes coordinated preparations (e.g., hurricanes/tropical storm). For instance, during Harvey preparation, worked with community to make sandbags to protect critical infrastructure like the water treatment plant. Recommendation: Coordination continues will keep as a 2021 action.
Mitigation Action No.18 - (2012) Increase flood predictive capability for streams and creeks that affect DD6 (stream gauges, to include adding prior flood levels to current gauges). Hazard(s) Addressed: Flood, Hurricanes and Tropical Storms, Tornadoes, and Severe Thunderstorms/High Winds Priority: High Estimated Cost: $675,000	Update: COMPLETE Through a flood protection grant from TWDB, District has added alert stations throughout the District boundaries and upgraded the software and equipment to withstand disaster and to provide more accurate data. Recommendation: Will be removed in next plan and not include in action prioritization.
Mitigation Action No. 19 - (2012) Develop distribution centers in local libraries, DD6 facilities, DD6 website and other public buildings where information and safety guidance on natural and manmade hazards as well as ways to mitigate hazards can be provided to citizens. Hazard Addressed: Flood Priority – Medium Estimated Cost: 25,000	Update: COMPLETE. DD6 has moved this information to its website where there is information (FAQ and About Section: Glossary). In addition, the District placed paid promotions in local papers to make information available to the public and to inform the public of the website where this information can be found. Issues: None Recommendation: Will be removed in next plan and not include in action prioritization.
Mitigation Action No. 20 - (2012) E Ditch No. 901 Re-routing Subdivision road flooding. The City of	Update: Removing. While the study is complete, the City has not yet determined

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
Beaumont study is underway for this and other area flooding to determine how best to mitigate. Once the study is complete, will work with City to determine next steps for a project. Hazard(s) Addressed: Flood Priority: High Estimated Cost: $13,500,000	projects. As projects are defined, the District will work with the City. In addition, any development in the 901 watershed requires detention ponds as required in the District's regulation. Issues: NONE Recommendation: Will be removed in next plan and not include in action prioritization.
Mitigation Action No. 21 - (2012) Periodically perform engineering and structural surveys on DD6 facilities (e.g., command and control facilities) to ensure that they are sufficiently protected from effects of hazards. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Tornadoes, and Severe Thunderstorms/High Winds Priority – Medium Estimated Cost: 25,000	Update: Ongoing. Structures are surveyed after an event to determine if there are issues. If issues found, they are fixed to continue to protect against the effects of wind and rain. Issues: NONE Recommendation: Will keep action
Mitigation Action No. 26 - (2012) Formalize procedures on DD6 roles and responsibilities before, during and after a hazard event. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Tornadoes, and Severe Thunderstorms/High Winds Priority: Medium Estimated Cost: $Cost is employee time and preparation of procedures	Update: Ongoing. The District continues to formalize procedures on DD6 roles and responsibilities before, during and after a hazard event. Issues: None Recommendation: Will keep action
Mitigation Action No. 1 - (2017) Detention project to help mitigate flooding on Delaware Street. Addressed Hazard - Flood, Hurricanes and Tropical Storms Priority: Medium/High Estimated Cost: N/A	Update: Remove. Project was turned over to the City of Beaumont Issues: NONE Recommendation: Will be removed in next plan and not include in action prioritization.

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
Mitigation Action No. 2 – (2017) Ditch 609 (South China Relief) 20,000 linear feet of open channel is planned to be enlarged as well as replacement of six crossings including an inverted siphon for a major Lower Neches Valley Authority (LNVA) canal. Also, a portion of a canal will be relocated to provide space for a much-needed drainage ditch Addressed Hazard - Flood, Hurricanes and Tropical Storms Priority: High Estimated Cost: $6-8 Million	Update: ONGOING. The District applied for funds in DR 4332 (Harvey) and was awarded a grant in two phases. Phase I is the design and environmental and is complete. The District is awaiting close out of phase I and award of Phase II by FEMA Issues: NONE Recommendation: Should be completed by the next iteration of this plan update.
Mitigation Action No. 3 – (2017) Ditch 100 A (East Caldwood) 2,200 feet of unmaintainable channel is planned to be retrofitted with an underground culvert to allow for shaping and resizing the ditch to allow for continued maintenance Addressed Hazard - Flood, Hurricanes and Tropical Storms Priority: High Estimated Cost: $300,000	Update: COMPLETE Issues: NONE Recommendation: Will be removed in next plan and not include in action prioritization.
Mitigation Action No. 4 – (2017) Amelia Cutoff Detention Diversion. The scope of work is to construct a diversion channel that will redirect half of the flood flow away from the Amelia Cutoff flume structure. Addressed Hazard - Flood, Hurricanes and Tropical Storms Priority: High Estimated Cost: $3.2 Million	Update: The District applied for FMA 2018 funds and was awarded the grant in 2021. Once the final USACE determination is complete, the construction will start. Issues: NONE Recommendation: Should be completed by next iteration of this plan update.
Mitigation Action No. 5 – (2017) Taylor's Bayou. Project has been permitted through the U.S. Army Corps of Engineers, All of necessary right-of-way has been purchased. Jefferson County Drainage District	Update: In Process. The TXDOT portion of lengthening the bridge and widening the bayou will be done by early 2022. The County is lengthening the bridge at HWY 124 and widening the bayou with a HUD

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
No. 6 has begun this 3-year project. Would protect approximately 227 homes and many businesses. Addressed Hazard - Flood, Hurricanes and Tropical Storms Priority: High Estimated Cost: $13 Million	grant and that will be completed 2-3 years. Issues: NONE Recommendation: Should be completed by next iteration of this plan update.
Mitigation Action No. 7 – (2017) Whites Ranch outfall structures four @ $250,000 each. One a year for four years. Addressed Hazard - Flood, Hurricanes and Tropical Storms Priority: High Estimated Cost: $1 Million	Update: In process. Engineering all complete for all four. One structure is complete. The remaining structures will take one year each (three years total). Will be completed in 3-5 years. Issues: NONE Recommendation: Should be completed by next iteration of this plan update.
Mitigation Action No. 8 – (2017) Ditch 119 Crossings at Yount and Edson This will be a joint project with the City of Beaumont. The City will purchase the box culverts and Jefferson County Drainage District No. 6 will install them, along with the erosion control. Then, the City of Beaumont will reconstruct the street over the box culverts. The City of Beaumont's Engineering Department is currently considering eliminating the Yount Street crossing altogether and leaving an open channel with dead-end cul-de-sacs on each side. The City is performing traffic analysis and taking public input. Addressed Hazard - Flood, Hurricanes and Tropical Storms Priority: High/Medium Estimated Cost: $340,000	Update: In Process. Due to a shift in prioritization, the project timeline has been extended. Issues: NONE Recommendation: Should be completed by next iteration of this plan update.
Mitigation Action No. 9 – (2017) JD Murphree Outfall	Update: COMPLETE Issues: NONE

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
Addressed Hazard - Flood, Hurricanes and Tropical Storms Priority: High Estimated Cost: $1 Million	Recommendation: Will be removed in next plan and not include in action prioritization.
Mitigation Action No. 16 – (2017) Procurement of NOAA All Hazard Radios and distribute them to key personnel Addressed Hazard - Flood, Hurricanes and Tropical Storms, Tornadoes, Severe Thunderstorms and high winds Priority: Medium Estimated Cost: $2,500-5,000	Update: COMPLETE Issues: NONE Recommendation: Will be removed in next plan and not include in action prioritization.
Mitigation Action No. 17 – (2017) Borley Heights Outfall Channelization and NLVA canal crossing addition. Project will accelerate the floodwater out of the Borley Heights subdivision and across the Lower Neches Valley Authority BI Canal and into Griffin Ditch which was improved with an FMA grant (all of GD ditches were widened and all of its crossing enlarged). Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High Estimated Cost: $6 Million	Update: Ongoing. The District has applied and will continue to apply for FEMA grants. If awarded, project will be a two-year project. This project is contingent upon grant funding. Issue: Funding Recommendation: Will keep as action item.
Mitigation Action No. 18 – (2017) Neches River Diversion Project would Divert flood flows out of the City of Beaumont and the Hillebrandt watershed into the Neches River to relieve flooding in Beaumont and relieve Hillebrandt Bayou downstream. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Tornadoes, Severe Thunderstorms and high winds Priority: High	Update: Ongoing. The District will continue to apply for FEMA grants and if awarded, the project will take two years to complete. The project is contingent upon funding. Issue: Funding

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
Estimated Cost: $500 Million	Recommendation: Will keep as an action item. However, as the study is now complete, it will be broken into four action items by street (Blanchette, Tevis, South Park and Lucas) at $100 million a project.
Mitigation Action No. 19 – (2017) The Bayou Din Detention Basin. Detain floodwater on Hillebrandt Bayou and its tributaries to relieve flooding downstream and allow channelization projects upstream. This would Include Detention on Bayou Din as identified in the Bernard Johnson Incorporated Master Drainage Plan 1986. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High Estimated Cost: $70 Million	Update: Ongoing. The District will continue to apply for FEMA grants and if awarded, the project will take two years to complete. The project is contingent upon funding. Issue: Funding Recommendation: Will keep as an action item.
Mitigation Action No. 20 – (2017) Nome Relief. Detain floodwaters on Taylors Bayou tributaries 804B and 804D to relieve flooding downstream and allow channelization projects upstream to relieve flooding in Nome Texas. Will include a detention basin. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High Estimated Cost: $2.5 Million	Update: The District applied for FMA 2020 funds and project has been identified for further review in FEMA FMA 2020. The District is working on providing additional information for project. If awarded, project will take two years to complete. Issues: NONE Recommendation: If awarded, should be completed by next iteration of this plan update.
Mitigation Action No. 21 – (2017) – China Relief. Detain floodwaters on Taylors Bayou tributaries 600 and 609 to relieve flooding downstream and allow channelization projects upstream to relieve flooding in China Texas. Will include a detention basin. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High	Update: The District applied for FMA 2020 funds and project has been identified for further review in FEMA FMA 2020. The District is working on providing additional information for project. The grant is for the tributary 600. 609 is being done separately not part of this application. For 609, District has bought right of way and construction is

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
Estimated Cost: $3 Million	underway. If awarded, project will take two years to complete. Issues: This action is really two actions and will be split (600) and (609) as two distinct projects. Recommendation: If awarded, should be completed by next iteration of this plan update.
Mitigation Action No. 22 – (2017) Study Ditch 505 Detention to detain floodwaters on Taylors Bayou tributary ditch 505 in order to provide flood relief downstream and allow channelization projects to relieve flooding in the Fannett area. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High Estimated Cost: $13.5 Million	Update: Ongoing. The District applied for FMA 2020 funds and project has been identified for further review in FEMA FMA 2020. The District is working on providing additional information for project. If awarded, project will take two years to complete. Issues: NONE Recommendation: If awarded, should be completed by next iteration of this plan update.
Mitigation Action No. 23 – (2017) Concrete line ditch assessment and repair. Evaluate and characterize concrete lined ditch damage throughout the District to estimate repair costs and pursue opportunities for funding for rehabilitation of these channels in order to provide improved flood flow conveyance Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High Estimated Cost: $100 Million	Update: Ongoing. Engineering firm has been hired and provided a conditions assessment to determine the conditions of the ditches, the cost to repair and the cost if not repaired. Some of the assessments have been completed. Issues: Once repairs are known, District will apply for grants to help to rehabilitation. Recommendation: Will keep as an action item.
Mitigation Action No. 24 – (2017) Pursue Cost Effective Projects to eliminate flooding in the District. The District, with engineering and environmental analyses, will continue to identify cost effective projects and pursue federal grants where possible.	Update: Ongoing. The District continues to identify cost effective projects and while not always named in the plan updates, these projects are important to pursue federal grant funding where

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High Estimated Cost: $10,000 - $45,000 is for engineering, BCA and environmental support for applications.	possible. Cost of projects are based on analyses. Issues: NONE Recommendation: Will keep as an action item.
Mitigation Action No. 24 – (2017) – Tyrrell Park Detention II - Excavate a detention basin adjacent to Hillebrandt Bayou on property owned by City. Contingent upon finding funding. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High Estimated Cost: $60 Million	Update: The District will continue to apply for FEMA grants and if awarded, the project will take two to five years to complete. The project is contingent upon funding. Issue: Funding Recommendation: Will keep as an action item.
Mitigation Action No. 25 – (2017) – Fannin Street Diversion Project - Divert flood flows out of the City of Beaumont and the Hillebrandt watershed (Cartwright Corley, 4th Street to Fannin Street) into the Neches River to relieve flooding in Beaumont and relieve Hillebrandt Bayou downstream. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High Estimated Cost: $51 Million	Update: The District will continue to apply for FEMA grants and if awarded, the project will take two to five years to complete. The project is contingent upon funding. Issue: Funding Recommendation: Will keep as an action item.
Mitigation Action No. 26 – (2017) – Virginia Street Detention - Construct a series of six detention basins along Virginia Street, west of Avenue A and east of 4th Street in the south end of the City of Beaumont along with underground delivery culverts in Virginia Street as well as Avenue A. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds	Update: The District will continue to apply for FEMA grants and if awarded, the project will take two to five years to complete. The project is contingent upon funding. Issue: Funding Recommendation: Will keep as an action item.

Mitigation Actions in Current Plan (2012 and 2017)	Update on Status Recommendation
Priority: High Estimated Cost: $9.7 Million	
Mitigation Action No. 27 – (2017) – Delaware Street Detention - Excavate approximately 1,300-acre feet of detention south of Delaware Street, west of Dowlen Road in the west end of the City of Beaumont and construct underground culverts to deliver water from Hillebrandt Bayou to the new detention. Addressed Hazard - Flood, Hurricanes and Tropical Storms, Severe Thunderstorms, and High Winds Priority: High Estimated Cost: $25 Million	Update: The District will continue to apply for FEMA grants and if awarded, the project will take two to five years to complete. The project is contingent upon funding. Issue: Funding Recommendation: Will keep as an action item.

Identification of New Actions

After a review of the actions in the current plan, the MPC began a process to identify new actions. They primary types of mitigation actions to reduce long-term vulnerability include:

- Local plans and regulations;
- Structure and infrastructure projects;
- Natural systems protections;
- Initiatives; and
- Education and Awareness programs.

The MPC utilized a version of FEMA's Mitigation Implementation Action Summary Worksheet to help describe important information about the action. After the actions were prioritized (discussed next section), the Actions Summary Worksheets were converted into the Mitigation Action Table 4-3.

Evaluate and Prioritize

In order to evaluate feasibility and analyze prioritization of actions, all new and existing actions were reviewed by the MPC. The process utilized the Mitigation Action Implementation Tool. The MPC was asked to consider the feasibility of identified mitigation actions as high, medium or low and using the Mitigation Action Evaluation Tool (Life Safety, Property Protection, Technical, Political, Legal, Environmental, Social, Administration, Local Champion, and Other Community Objectives) rank the category 1-10 with 1 being a low priority for the category and 10 being a high for the category. Low is defined as 1-50; Medium is defined as 51-75; and High is defined as 76-100. The results are depicted in Tables 4-2 and 4-3. Table 4-2 lists the action by mitigation type (e.g. Education and Awareness) and provides the hazard(s) addressed. Table 4-3 is a summary of the mitigation action by priority which High and numeric value indicating the mitigation action number. Cost-effectiveness was considered with each action.

Table 4-2 - Mitigation Prioritization

Mitigation Action Prioritization (1-10) Ranked with 1 being low priority for that category and 10 being high for the Category Minimum Score: 1 Maximum Score 100 TOTAL SCORE BETWEEN 1-50 HAZARD IS LOW PRIORITY (L) TOTAL SCORE BETWEEN 51-75 HAZARD IS MEDIUM PRIORITY (M) TOTAL SCORE BETWEEN 76-100 HAZARD IS HIGH PRIORITY (H)	Life Safety	Property	Technical	Political	Legal	Environment	Social	Admin	Local Champ	Other Comm	Total	Priority	Addressed Hazard DR: Drought DF: Dam Failure EH: Extreme Heat F: Flood H/TS: Hurricane/TS ST/HW: Severe Thunderstorm/ High Wind T: Tornadoes W: Winter storm/Severe Winter Weather
Education and Awareness													
Enhance DD6's internal GIS capabilities	1	10	8	10	10	4	10	10	8	10	81	H	DR, EH, F, H/TS, ST/HW, T, W
Formalize Procedures for hazard event	1	10	10	10	10	1	8	10	8	10	78	H	DR, EH, F, H/TS, ST/HW, T, W
Coordination efforts with USACE on Sam Rayburn Dam	3	3	3	3	10	10	10	3	2	3	50	L	DF
Coordination efforts with USACE on Town Bluff Dam	3	3	3	3	10	10	10	3	2	3	50	L	DF
Structure/Infrastructure													
Ditch 609 (South China Relief)	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS
Amelia Cutoff Detention Diversion	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Taylor's Bayou Project	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Ditch 119 Crossings at Yount and Edson	7	5	10	2	10	10	5	9	10	5	73	M	F, H/TS, ST/HW, T, W
Borley Heights Outfall Channelization and NLVA canal crossing addition	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
The Bayou Dinn Detention Basin	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Nome Relief	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
East China Relief. Detain floodwaters on Taylors Bayou tributaries 600	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
West China Detention Relief. Detain floodwaters on Taylors Bayou tributaries 609	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Ditch 505 Detention	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Tyrrell Park Detention II	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
North Cheek Relief	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Ditch 100-A	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Ditch 117	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Green Pond Detention East Detention	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Whites Ranch outfall structures	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Concrete line ditch repair	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Delaware Street Detention	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Virginia Street Detention	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Blanchette Diversion	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Tevis Street Diversion	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
South Park Diversion	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Lucas Street Diversion	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Pursue Cost Effective Projects to eliminate Flooding in the District	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Fannin Diversion	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS, ST/HW, T, W
Natural Systems Protections													
Initiatives													
Create severe weather plan	10	10	10	10	10	10	10	9	10	10	99	H	All Hazards
Local Plans (studies/reports)/Regulations													
Coordination with Local Partners on Flood Predictions and Recovery work	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS/ ST/HW
New Master plan and Watershed Study	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS
Engineering and Structural Survey on DD6 Facilities	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS/ ST/HW, T, W
Concrete line/earthen channel ditch assessment	10	10	10	10	10	10	10	9	10	10	99	H	F, H/TS/ ST/HW, T, W

Table 4-3 - Mitigation Action Summary of Prioritization

Action No.	MITIGATION ACTION SUMMARY OF PRIORITIZATION TOTAL SCORE BETWEEN 1-50 HAZARD IS LOW PRIORITY (L) TOTAL SCORE BETWEEN 51-75 HAZARD IS MEDIUM PRIORITY (M) TOTAL SCORE BETWEEN 76-100 HAZARD IS HIGH PRIORITY (H)	Total	priority
2	Create severe weather plan	99	H
3	Coordination with Local Partners on Flood Predictions and Recovery work	99	H
4	Engineering and Structural Survey on DD6 Facilities	99	H
6	Ditch 609 (South China Relief)	99	H
7	Amelia Cutoff Detention Diversion	99	H
8	Taylor's Bayou Project	99	H
9	Whites Ranch outfall structures	99	H
11	Borley Heights Outfall Channelization and NLVA canal crossing addition	99	H
12	Ditch 100-A	99	H
13	Blanchette Diversion	99	H
14	Tevis Street Diversion	99	H
15	South Park Diversion	99	H
16	Lucas Street Diversion	99	H
17	The Bayou Dinn Detention Basin	99	H
18	Nome Relief	99	H
19	East China Relief. Detain floodwaters on Taylors Bayou tributaries 600	99	H
20	West China Detention Relief. Detain floodwaters on Taylors Bayou tributaries 609	99	H
21	Ditch 505 Detention	99	H
22	Concrete line/earthen channel ditch assessment	99	H
23	Concrete line ditch repair	99	H
24	Pursue Cost Effective Projects to eliminate Flooding in the District	99	H
25	New Master plan and Watershed Study	99	H
26	Tyrrell Park Detention II	99	H
27	North Cheek Relief	99	H
28	Ditch 117	99	H
29	Green Pond Detention East Detention	99	H
30	Delaware Street Detention	99	H
31	Virginia Street Detention	99	H
34	Fannin Diversion	99	H
1	Enhance DD6's internal GIS capabilities	81	H
5	Formalize Procedures for hazard event	78	H
10	Ditch 119 Crossings at Yount and Edson	73	M
32	Coordination efforts with USACE on Sam Rayburn Dam	50	L
33	Coordination efforts with USACE on Town Bluff Dam	50	L

New Mitigation Actions

The District has 34 actions for this iteration of the plan and information regarding each action is described in The Mitigation Action Table 4-4. Each action provides:

- Title and if moved from past plan or is a new action for this iteration
- Hazards that action addresses
- Description of the action

- The agency that would lead the efforts on the action
- Estimated cost and potential funding sources
- Approximate time frame for project
- The Priority is received (H/M/L)
- If the action protects current buildings and infrastructure, or new or both
- Discussion of cost and benefit considerations.

Table 4-4 JCDD6 Mitigation Actions

<table>
<tr><td colspan="4">* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development
Action #1</td></tr>
<tr><td colspan="4">Title: Enhance DD6's internal GIS capabilities
(moved from current plan into new actions)</td></tr>
<tr><td>Hazard</td><td colspan="2">Description/Issue</td><td>Implementing Department</td></tr>
<tr><td>Flood
Hurricane/TS
Severe storms/HW
Storm surge
Tornados</td><td colspan="2">Continue to enhance JCDD6's internal GIS capabilities</td><td>JCDD6</td></tr>
<tr><td>Cost Estimate/Funding</td><td>Time Frame</td><td>Priority</td><td>Risk Focus (A/B) *</td></tr>
<tr><td>Cost Estimate: $20,000-50,000
Funding: CIP, Grants</td><td>Ongoing</td><td>H</td><td>A</td></tr>
<tr><td colspan="4">Cost and Benefits Considerations</td></tr>
<tr><td colspan="4">Cost is for updating existing software, purchasing new programs and hardware to keep up with GIS changes.</td></tr>
</table>

Action #2			
Title: Create severe weather action plan (moved from current plan into new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS Severe Storms/Wind Storm Surge Tornado Winter Storm	Create severe weather action plan, conduct drills, identify and promulgate evacuation and sheltering options	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: Labor and equipment costs Funding: Operating and Maintenance Budget	Ongoing	H	A/B
Cost and Benefits Considerations			
Cost is for labor and equipment needed to run drills and for assessments of real time maintenance zone work.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #3			
Title: Coordination with Local Partners on Flood Predictions and Recovery work (moved from current plan into new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Increase coordination with the City and County regarding flood predictions and post event recovery work.	JCDD6/Jefferson County/ City of Beaumont	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: Labor and some material Funding: Grants, operating budget	Ongoing	H	A
Cost and Benefits Considerations			
Cost is labor cost to analyze and provide District information to local partners for flood predictions and providing labor, materials and equipment prior to an event (sandbags at critical facilities) and recovery.			

Action #4			
Title: Engineering and Strucural Survey on DD6 Facilities (moved from current plan into new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricanes/TS T'storms/High Wind Tornadoes Winter Storm	Periodically perform engineering and structural surveys on DD6 facilities (e.g. command and control facilities) to ensure that they are sufficiently protected from effects of hazards.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $25,000 Funding: Operations and Maintenance budgets	Ongoing	M	A
Cost and Benefits Considerations			
Cost is employee time, use of District equipment and materials.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #5			
Title: Formalize Procedures for hazard event (moved from current plan into new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS Severe Thunderstorm/High Wind Tornados Winter storm	Formalize procedures on DD6 roles and responsibilities before, during and after a hazard event.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: Labor Funding: Operating budget	Ongoing	M	A/B
Cost and Benefits Considerations			
Cost is time, data and preparation of procedures.			

Action #6			
Title: Ditch 609 (South China Relief) (moved from current plan into new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	20,000 linear feet of open channel is planned to be enlarged as well as replacement of six crossings including an inverted siphon for a major Lower Neches Valley Authority (LNVA) canal. Also, a portion of a canal will be relocated to provide space for a much needed drainage ditch.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $6-8 Million Funding: Grants, CIP	2021-2026	H	A/B
Cost and Benefits Considerations			
The District applied for funds in DR 4332 (Harvey) and was awarded a grant in two phases. Phase I is the design and environmental and is complete. The District is awaiting close out of phase I and award of Phase II by FEMA			

Action #7			
Title: Amelia Cutoff Detention Diversion (moved from current plan into new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	The scope of work is to construct a diversion channel that will redirect half of the flood flow away from the Amelia Cutoff flume structure.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $4,246,000.00 Funding: CIP Budget, Grants	2021-2026	H	A
Cost and Benefits Considerations			
The District applied for FMA 2018 funds and was awarded the grant in 2021. Once the final USACE determination is complete, the construction will start and should be completed before next iteration of plan update.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #8			
Title: Taylor's Bayou Project (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Project has been permitted through the U.S. Army Corps of Engineers, All of necessary right-of-way has been purchased. Jefferson County Drainage District No. 6 has begun this 3-year project.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: 13.5 Million Funding: Federal Grants	2020-2025	H	A
Cost and Benefits Considerations			
Cost is approximately $13.5 million. Would protect approximately 227 homes and many businesses.			

Action #9			
Title: Whites Ranch outfall structures - four (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Whites Ranch outfall structures four @ $250,000 each. One a year for four years.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: 1 Million Funding: CIP, Grants	2021-2026	H	A/B
Cost and Benefits Considerations			
Will protect valuable agricultural land and miles of roadways.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #10			
Title: Ditch 119 Crossings at Yount and Edson (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	This will be a joint project with the City of Beaumont. The City will purchase the box culverts and Jefferson County Drainage District No. 6 will install them, along with the erosion control. Then, the City of Beaumont will reconstruct the street over the box culverts. The City of Beaumont's Engineering Department is currently considering eliminating the Yount Street crossing altogether and leaving an open channel with dead-end cul-de-sacs on each side. The City is performing traffic analysis and taking public input.	JCDD6 City of Beaumont	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $340,000	2021-2026	M	A
Cost and Benefits Considerations			
Would protect approximately 50 homes as well as help make a dangerous road that floods significantly become safer.			

Action #11			
Title: Borley Heights Outfall Channelization and NLVA canal crossing addition (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Project will accelerate the floodwater out of the Borley Heights subdivision and across the Lower Neches Valley Authority BI Canal and into Griffin Ditch which was improved with an FMA grant (all of GD ditches were widened and all of its crossing enlarged).	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $6,000,000 Funding: Grants and general operating budget	2022-2027	H	A
Cost and Benefits Considerations			
There are 250 homes in the area that have flooded in the past and this project could help mitigate future flooding. However, a full BCA would need to be done to determine costs and benefits.			

A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #12*			
Title: Channel 100-A			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Concrete-lined drainage channel proposed project is intended to restore sections of compromised channel embankment and replace failed sections of concrete riprap with properly reinforced concrete channel lining. The proposed improvements will remove restrictions within the channel and restore flood-carrying capacity.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $40,000,000 Funding: Grants and general operating budget	2022-2027	H	A
Cost and Benefits Considerations			
Cost to not repair could cause worsening damage.			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development
Action #13
Title: Blanchette Diversion Project (moved from current plan formerly Neches River to new actions)

Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Divert flood flows out of the City of Beaumont and the Hillbrant watershed into the Neches River to relieve flooding in Beaumont and relieve Hillebrant Bayou downstream.	JCDD6 and City of Beaumont	
Cost Estimate/Funding	**Time Frame**	**Priority**	**Risk Focus (A/B) ***
Cost Estimate: $100 Million Funding: Federal Grants (e.g.. CDBG/FEMA HMGP)	2022-2027	H	A/B
Cost and Benefits Considerations			
This will protect 1/8 of the City of Beaumont from repetitive flooding.			

Action #14
Title: Tevis Diversion Project (moved from current plan formerly Neches River to new actions)

Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Divert flood flows out of the City of Beaumont and the Hillbrant watershed into the Neches River to relieve flooding in Beaumont and relieve Hillebrant Bayou downstream.	JCDD6 and City of Beaumont	
Cost Estimate/Funding	**Time Frame**	**Priority**	**Risk Focus (A/B) ***
Cost Estimate: $ 100 Million Funding: Federal Grants (e.g.. CDBG/FEMA HMGP)	2022-2027	H	A/B
Cost and Benefits Considerations			
This will protect 1/8 of the City of Beaumont from repetitive flooding.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #15

Title: South Park Diversion Project
(moved from current plan formerly Neches River to new actions)

Hazard	Description/Issue	Implementing Department
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Divert flood flows out of the City of Beaumont and the Hillbrant watershed into the Neches River to relieve flooding in Beaumont and relieve Hillebrant Bayou downstream.	JCDD6 and City of Beaumont

Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $ 100 Million Funding: Federal Grants (e.g.. CDBG/FEMA HMGP)	2022-2027	H	A/B

Cost and Benefits Considerations

This will protect 1/8 of the City of Beaumont from repetitive flooding.

Action #16

Title: Lucas Diversion Project
(moved from current plan formerly Neches River to new actions)

Hazard	Description/Issue	Implementing Department
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Divert flood flows out of the City of Beaumont and the Hillbrant watershed into the Neches River to relieve flooding in Beaumont and relieve Hillebrant Bayou downstream.	JCDD6 and City of Beaumont

Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $ 200 Million Funding: Federal Grants (e.g.. CDBG/FEMA HMGP)	2022-2027	H	A/B

Cost and Benefits Considerations

This will protect 1/8 of the City of Beaumont from repetitive flooding.

Action #17			
Title: The Bayou Dinn Detention Basin (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Detain floodwater on Hillebrant Bayou and its tributaries to relieve flooding downstream and allow channelization projects upstream. This would Include Detention on Bayou Dinn as identified in the Bernard Johnson Incorporated Master Drainage Plan 1986.	JCDD6 and Jefferson County	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $70,000,000 Funding: Federal Grants (e.g. CDBG/FEMA HMGP)	2022-2027	H	A/B
Cost and Benefits Considerations			
Many houses will benefit in the south end of the Beaumont Texas as well as the rural area Fannett, Labelle, and Cheek.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #18			
Title: Nome Relief (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Detain floodwaters on Taylors Bayou tributaries 804B and 804D to relieve flooding downstream and allow channelization projects upstream to relieve flooding in Nome Texas. Will include a detention basin.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $3,500,000 Funding: Grants and general operating budget	2022-2027	H	A
Cost and Benefits Considerations			
Relieves the frequency of flooding in the City of Nome. BCA done that demonstrated cost effective. Project has been identified for further review for potential award in FMA 2020.			

Action #19			
Title: East China Relief. Detain floodwaters on Taylors Bayou tributaries 600 (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Bayou tributaries 600 to relieve flooding downstream and allow channelization projects upstream to relieve flooding in China Texas. Will include a detention basin.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $2.85 Million Funding: Grants and general operating budget	2022-2027	H	A
Cost and Benefits Considerations			
BCA done that demonstrated cost effective. Project has been identified for further review for potential award in FMA 2020.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #20			
Title: West China Detention Relief. Detain floodwaters on Taylors Bayou tributaries 609 (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High	Detain floodwaters on Taylors Bayou tributaries 609 to relieve flooding downstream and allow channelization projects upstream to relieve flooding in China Texas. Will include a detention basin.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $2.5 Million Funding: General operating budget	2021-2024	H	A
Cost and Benefits Considerations			
Relieves the frequency of flooding in the City of China. District has started construction on this project.			

Action #21			
Title: Ditch 505 Detention (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Detain floodwaters on Taylors Bayou tributary ditch 505 in order to provide flood relief downstream and allow channelization projects to relieve flooding in the Fannett area.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $13,500,000 Funding: Grants and general operating budget	2022-2027	H	A
Cost and Benefits Considerations			
Relieves the frequency of flooding in Fannet. BCA done that demonstrated cost effective. Project has been identified for further review for potential award in FMA 2020.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #22				
Title: Concrete line/earthen channel ditch assessment				
Hazard	Description/Issue		Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Evaluate and characterize concrete lined ditch damage throughout the district to estimate repair costs and pursue opportunities for funding.		JCDD6	
Cost Estimate/Funding		Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $100,000 Funding: Grants, operating budget		Ongoing	H	A/B
Cost and Benefits Considerations				
Will provide additional capacity to remove floodwaters out the populated areas of the City of Beaumont.				

Action #23				
Title: Concrete line ditch repair District-wide (moved from current plan to new actions)				
Hazard	Description/Issue		Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Cost to repairs concrete line ditches and pursue opportunities for funding for rehabilitation of these channels in order to provide improved flood flow conveyance		JCDD6	
Cost Estimate/Funding		Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $100,000,000 Funding: Grants, operating budget		Ongoing	H	A/B
Cost and Benefits Considerations				
Will provide additional capacity to remove floodwaters out the populated areas of the City of Beaumont.				

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #24				
Title: Pursue Cost Effective Projects to eliminate Flooding in the District (moved from current plan to new actions)				
Hazard	Description/Issue		Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds Storm Surge	Pursue Cost Effective Projects to eliminate flooding in the District. The District, with engineering and environmental analyses, will continue to identify cost effective projects and pursue federal grants where possible		JCDD6	
Cost Estimate/Funding		Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $10,000-$45,000 Funding: Grants, operating budget		Ongoing	H	A/B
Cost and Benefits Considerations				
Estimated Cost: $10,000 - $45,000 is for engineering, BCA and environmental support for applications. Cost of identified projects is based on the analyses.				

Action #25			
Title: 2022 New Action - Prepare New Master plan and Watershed Study			
Hazard	Description/Issue	Implementing Department	
Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Study new master plan and watershed study for the Pine Isand Bayou, Hillebrandt Bayou, and Taylors Bayou watershed.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $8.5 Million Funding: Grants and general operating budget	2021-2023	H	A
Cost and Benefits Considerations			
Helps to identify projects with best use methodologies.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #26			
Title: Tyrrell Park Detention II (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Excavate a detention basin adjacent to hillebrandt bayou on property owned by City. Contigent upon finding funding.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $60 Million Funding: Grants and general operating budget	Five years once funding is secured	H	A
Cost and Benefits Considerations			
Protects a large portion of the South part of Beaumont.			

Action #27

Title: 2022 New Action - North Cheek Relief			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	North Cheek Relief Ditch improvement and culvert enlargement North Cheek Division.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $120,000 Funding: General operating budget	2021-2022	H	A
Cost and Benefits Considerations			
Protect a subdivision of approximately 50 homes.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #28

Title: 2022 New Action Ditch 117			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Demolish existing concrete ditch and build new and enlarged ditch $1.7 Million. Flood relief to Briarcliff and Delaware Street. Will also add large concrete boxes.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $1.7 Million Funding: Operating Budget, Grants	2022-2027	H	A/B
Cost and Benefits Considerations			
Protects approximately 300 homes. Contigent of funding.			

Action #29

Title: 2022 New Action Green Pond Detention East Addition			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Purchase 800 acres add levy work to add to greenpond detention.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $2 Million Funding: Grants, operating budget	2022-2027	H	A/B
Cost and Benefits Considerations			
Protects approximately 300 homes downstream.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #30

Title: 2022 New Action - Delaware Street Detention			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Excavate approximately 1,300 acre feet of detenstion south of Delaware Street, west of Dowlen Road, and west end of City of Beaumont and construct underground culverts to deliver water from Hildebrandt Bayou to the new detention.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $25 Million Funding: Grants, operating budget	2022-2027	H	A/B
Cost and Benefits Considerations			
The project has been studied which resulted in the project being deemed cost effective.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development

Action #31

Title: 2022 New Action - Virginia Street Detention			
Hazard	Description/Issue	Implementing Department	
Flood	Construct a series of six detention basins along Virginia Street, west of Avenue A and east of 4th Street and the south end of Beaumont along with underground delivery culverts in Virginia as well as Avenue A.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $9.7 Million Funding: Grants, operating budget	2022-2027	H	A/B
Cost and Benefits Considerations			
The project was studied and deemed cost effective.			

Action #32

Title: 2022 New Action Coordination efforts with USACE on Sam Rayburn Dam			
Hazard	Description/Issue	Implementing Department	
Dam Failure	Work with USACE to learn of updates and risk information to the area in the event of a breach or overspill at Town Bluff Dam.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: Labor costs Funding: Grants, operating budget	2021-Ongoing	L	A/B
Cost and Benefits Considerations			
DD6 will plan to attend annual workshops to discover and become familiar with the actions.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development
Action #33

Title: 2022 New Action Coordiation efforts with USACE on Town Bluff Dam			
Hazard	Description/Issue	Implementing Department	
Dam Failure	Work with USACE to learn of updates and risk information to the area in the event of a breach or overspill at Town Bluff Dam.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $Minimal Funding: Grants, operating budget	2021 - Ongoing	L	A/B
Cost and Benefits Considerations			
DD6 will plan to attend annual workshops to discover and become familiar with the actions.			

* A= Actions reducing risk to existing buildings and infrastructure
* B= Actions reducing risk to new development
Action #34

Title: Fannin Street Diversion Project (moved from current plan formerly Neches River to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Divert flood flows out of the City of Beaumont and the Hillbrant watershed (Cartwright Torley, 4th to Fannin to the river) into the Neches River to relieve flooding in Beaumont and relieve Hillebrant Bayou downstream.	JCDD6 and City of Beaumont	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $51 Million Funding: Federal Grants (e.g.. CDBG/FEMA HMGP)	2022-2027	H	A/B
Cost and Benefits Considerations			
This will protect 1/8 of the City of Beaumont from repetitive flooding.			

Section 5 - Plan Maintenance Process

Introduction

The plan maintenance section of this document details the formal process that will ensure that JCDD6 hazard mitigation plan remains a responsive and relevant document. The maintenance process includes a schedule for monitoring and evaluating the plan annually and producing an updated plan every five years. It also describes how the District will integrate public participation throughout the plan and implementation process and explain how the District plans to incorporate the mitigation strategies outlined in this plan into existing planning mechanisms.

Update from Last Plan

The process did not change significantly from the last plan. The only update is utilization of the District's website more to disseminate information to the public. The Hazard Mitigation Plan Update is a collaborative process and led by the Chief Business Officer of the District who is the coordinator for the annual review, for forwarding any amendments to the Plan to the Texas Division of Emergency Management and for data collections in preparation of year four, where the District will begin the update process to this plan.

Monitoring, Evaluating, and Updating the Plan

The maintenance process includes a schedule for monitoring and evaluating the plan annually and producing an updated plan every five years.

The minimum task of the annual hazard mitigation planning team meeting will be the evaluation of the progress of the plan and incorporating the actions into other plans, reviewing risk assessment and hazards, reviewing the strategy and keeping key stakeholders and the public informed and involved. This review will include:

- Summary of any hazard events that occurred during the prior year and their impact on the community.
- Review of successful mitigation action identified in the plan.
- Review actions that were not completed to understand if there are impediments impacting the action (e.g., financial, technical, etc.)
- Re-evaluate the action plan to determine if the timeline for identified projects remains accurate (e.g., if funding becomes available, a long-term activity could become a near-term project)
- Recommendation for new mitigation actions and projects.
- Changes in potential for funding.
- Collection of maps and data to help with data needs for next iteration of plan.
- Impact of any other planning programs within the District that involve hazard mitigation.
- Review planning process to ensure key members are involved and updated including stakeholders and the public
- Review the hazards and the risk assessment to see if any updates or changes occurred or need to be re-assessed.
- Review the goal and strategy to ensure relevancy and current

In addition to the scheduled reports, the Chief Business Officer will convene meetings after damaging natural hazard events to review the effects of such events. Based on those effects, adjustments to the mitigation goals and actions may be made or additional event-specific actions identified. Such revisions shall be documented as outlined below:

Circumstances or conditions under which the JCDD6 will initiate Plan reviews and updates outside of the annual review:

- On the recommendation of the Chief Business Officer or on its own initiative, the District Board may initiate a Plan review at any time.
- At approximately the one-year anniversary of the updated plan's adoption, and every year thereafter (Annual Progress Reports).
- After natural hazard events that appear to significantly change the apparent risk to District assets, operations and/or citizens.
- When activities of the District, County, or the State significantly alter the potential effects of natural hazards on District assets, operations and/or citizen. Examples include completed mitigation projects that reduce risk, or actions or circumstances that increase risk.
- When new mitigation opportunities or sources of funding are identified.

In addition to the circumstances listed above, revisions that warrant changing the text of this Plan update or incorporating new information may be prompted by a number of circumstances, including identification of specific, new mitigation projects, completion of several mitigation actions, or requirements for qualifying for specific funding. Minor revisions may be handled by addenda.

Major comprehensive review of and revisions to this Hazard Mitigation Plan Update will be considered on a five-year cycle. The 2022 Plan will enter its next review cycle sometime in 2025, with adoption of that update in 2027. The MPC will be reconvened to conduct the comprehensive evaluation and revision.

Integration into Existing Plans, Procedures, and Programs

FEMA requires the project requirements from the Hazard Mitigation Plan shall be incorporated into other planning mechanisms, as applicable, during the routine re-evaluation and update of the District Plans. The current hazard mitigation plan was reviewed to assess what data could be used for several District reports that were prepared from 2017-2021. Members of the MPC either participate or provide information to the Cities and County capital improvement, comprehensive plan, emergency management plan, engineering design criteria, drainage studies, master utility plan and FIRM review committees to help facilitate data from this plan was reviewed and appropriately incorporated to those plans. Data from the current plan was used as follow:

- City of Beaumont Studies were reviewed to identify subject areas where mitigation activities and principles can be incorporated. Staff responsible for the mitigation plan are directly involved with the District's capital budget and support the City and County potential capital improvement projects to maximize mitigation effects (for example, by modifying a drainage project to address repetitive flood loss properties).

- City of Beaumont (EMP) 2017. As part of the Plan update, the EMP reviewed this plan to assist with identifying the hazards profiled in the HMP update, process and procedures to facilitate update up Annex P – Mitigation.
- City of Beaumont Master Drainage Plan – 2020 (which includes the Storm water Management Plan) reviewed the ordinances discussed in the plan.
- Flood Insurance Rate Maps (FIRMs) and the preliminary maps. Jefferson County FIS and FIRMs were reviewed to assist with identifying areas vulnerable to flooding within the District.

As with all plans and capabilities that are in place, the District continually reviews current documents and best management practices to continue to expand and improve services to our community. To better provide these capabilities, the MPC would continue to reach out to other City and County departments to incorporate their capabilities. This would include setting up meetings with City departments on an annual basis to review and incorporate any new capabilities.

In addition to the reports listed above, the following plans, studies and reports were reviewed, and necessary data was incorporated into this plan update:

- 2018 State of Texas Mitigation Plan.
- Jefferson County is working on its plan update at the same time as the District. The District has participated in two of its meetings, July and November as of this plan update.

Also, NOAA's NCEI databases and FEMA RL and SRL Data were used in support of the risk assessment.

Continued Public Involvement

Upon adoption of the Plan update, the public will be periodically updated through posts (on the District's website) and on the Annual Progress Reports under the plan monitoring strategy described above.

JCDD6 will involve the public in the plan maintenance process and during the major comprehensive review to the Plan in the same ways used during the original plan development. The public will be notified when the revision process is started and provided the opportunity to review and comment on changes to the plan and priority action items. It is expected that a combination of informational public meetings, surveys and questionnaires, draft documents posted on the website, and public Board meetings will be undertaken.

APPENDICES

Update from Last Plan:

- Added JCDD6 Glossary found on its website
- Added information on dam failure

APPENDIX A

Minutes from the MPC Meetings

Jefferson County Drainage District No. 6
Hazard Mitigation Plan Update MPC Meeting 1
September 24, 2021, 9:00 am CST MPC Attendees

Attendees	Department
Doug Canant	District Engineer, Engineering Department, JCDD6
Butch Wilson	Assistant District Engineer, Engineering Department, JCDD6
Karen Stewart	Chief Business Officer, Procurement Department, JCDD6
Chuck Oakley	Chief Financial Officer, Finance Department, JCDD6
Kristen Thatcher	Plan Consultant, JSWA
Dan Ward	Plan Consultant, JSWA

Introductions

Background and purpose of hazard mitigation plan (HMP) update

- Updating the HMP helps communities identify and understand risk from natural hazards that impact the community which helps to identify actions to reduce losses from those hazards and establish a coordinated process to implement the plan. It also keeps a community eligible to apply for FEMA mitigation grant funds.
- The current HMP approved in 2017, expires on 4-22-22.
- The 2022 plan update will be a single jurisdiction plan.

The plan update process

The plan update will be led by the Mitigation Planning Committee (MPC) who will:

- Determine what has changed within the JCDD6 planning area since 2017.
- Use FEMA guidance to guide plan update by reviewing current plan against that guidance to ensure all requirements are met.
- Provide information on changes in planning area and assets at risk over the past five years as well as any actions to protect those areas.
- Review and update any hazards that have occurred over the past five years.
- Review and provide the status of action items in current plan and after hazard profiles are complete, add new actions for each hazard that were not in the plan previously.

Identify MPC, Roles and Responsibilities

Team identified the following members to comprise the MPC:

Team Member	Title	Department	Role/Responsibility
Joseph Majdalani	General Manager	JCDD6	Data collection, analysis of hazards, identify actions Review drafts
Doug Canant	District Engineer	Engineering	Data collection, analysis of hazards, identify actions Review drafts

Team Member	Title	Department	Role/Responsibility
Butch Wilson	Asst. District Engineer	Engineering	Data collection, analysis of hazards, identify actions Review drafts Mapping support
Karen Stewart	Chief Business Officer	Procurement	Data collection, analysis of hazards, identify actions Review drafts
Chuck Oakley	Chief Financial Officer	Public Services	Data collection, analysis of hazards, identify actions Review drafts
Kristen Thatcher	Plan Coordinator	JSWA	Drafting plan based on updates, data and analysis from MPC, ensuring requirements are met for plan and, incorporating comments received from Stakeholders and Public
Dan Ward	Plan Coordinator	JSWA	Drafting plan based on updates, data and analysis from MPC, ensuring requirements are met for plan and, incorporating comments received from Stakeholders and Public

Review current stakeholders and update (need list before next meeting)
The Stakeholder group will be comprised of diverse interests including other government agencies, neighboring communities, businesses, civic groups, schools and drainage districts to help review and update mitigation plan. Initial discussion included the following organizations however, the team will work on the list and points of contact for each stakeholder and finalize before the next MPC meeting.

Organization	Point of Contact	Title
Sabine-Neches Navigation District		
Jefferson County Drainage District 7		
Jefferson County Drainage District 3		
City of Beaumont		
City of Nome		
City of China		
City of Bevil Oaks		
Jefferson County		
Liberty County		
Hardin County		
Orange County		
Chambers County		
Beaumont ISD		
Hardin-Jefferson ISD		
Hamshire-Fannett ISD		
Lamar University		
Baptist Beaumont Hospital		

Organization	Point of Contact	Title
Christus St. Elizabeth Hospital		
Texas Department of Transportation		
Lower Neches Valley Authority		
Exon Mobil Oil		
Goodyear Tire and Rubber		
Southeast Texas Regional Planning Comm.		
Jefferson County Chamber of Commerce		

Review Hazards from Last Plan

Using the overall FEMA hazard list, the MPC compared the hazards profiled in the current plan to determine if the hazard can affect the area, which hazards are most significant and is there a specific location the hazard impacts in the jurisdictional area or if the hazard occurs County-wide. Using the FEMA definition for classifications, the MPC defined each hazard. If the hazard does not occur in the area, after location was defined, no further classifications took place as the team recommended the hazard could be omitted (N/A) from a risk assessment and potential actions. As an example of location review, after historical discussion of any in area, for wildfire, the team reviewed the Texas A&M Forest Service Texas Wildfire Assessment to gather hazard data and to determine if hazard impacts area Wild Urban Interface (WUI) and determined it does not affect the area.

In addition, if a hazard, not previously profiled, is located in the area, the classification review occurred. After the review, the team discussed if all measures that the District could take to mitigate that hazard had been exhausted. If that were the case, the hazard would not receive a risk assessment and in the omission section it the mitigation efforts would be explained (fully mitigated). For instance, the team discussed lightening and concluded that while it does occur in the area, all actions to mitigate (e.g., all JCDD6 buildings are grounded for surge, electric and communication protection) are already in place, therefore, the plan will omit lightning. The team also reviewed any historical occurrences and geological analysis for subsidence in the area and it was concluded that there were no occurrences, and the topography does not suggest subsidence is an issue so it will not profile.

Finally, some hazards seem to be able to be merged with other hazards. For instance, extreme cold can be included with winter weather in this jurisdictional area. Also, storm surge is a product of hurricanes and tropical storms in this area and can be included in that hazard review. After the review and discussion, the following hazards will be assessed and mitigation actions will be determined: dam failure, drought, erosion, flood, Hurricane/Tropical Storms, Severe Thunderstorms/Wind, Severe winter weather and tornadoes.

Significance to Area defined by location

Location	Maximum Probable Event	Likelihood of Occurrence	Overall Significance
N, L, S, E	W, M, S, E	U, O, L, H	L, M, H

Definitions for Classifications

Location (Geographic Area Affected)

- **Negligible:** Less than 10 percent of planning area or isolated single-point occurrences
- **Limited:** 10 to 25 percent of the planning area or limited single-point occurrences
- **Significant:** 25 to 75 percent of planning area or frequent single-point occurrences
- **Extensive:** 75 to 100 percent of planning area or consistent single-point occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)

- **Weak:** Limited classification on scientific scale, slow speed of onset or short duration of event, resulting in little to no damage
- **Moderate:** Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, resulting in some damage and loss of services for days
- **Severe:** Severe classification on scientific scale, fast speed of onset or long duration of event, resulting in devastating damage and loss of services for weeks or months
- **Extreme:** Extreme classification on scientific scale, immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions

Hazard	Scale / Index	Weak	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index[3]	-1.99 to +1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 and below
Earthquake	Modified Mercalli Scale[4]	I to IV	V to VII	VII	IX to XII
	Richter Magnitude[5]	2, 3	4, 5	6	7, 8
Hurricane Wind	Saffir-Simpson Hurricane Wind Scale[6]	1	2	3	4, 5
Tornado	Fujita Tornado Damage Scale[7]	F0	F1, F2	F3	F4, F5

Probability of Future Events

- **Unlikely:** Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
- **Occasional:** 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- **Likely:** 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- **Highly Likely:** 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year.

Overall Significance

- **Low:** Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area. This rating is sometimes used for hazards with a minimal or unknown record of occurrences or for hazards with minimal mitigation potential.
- **Medium:** The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometimes used for hazards with a high extent rating but very low probability rating.
- **High:** The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

Hazard List	2017 JCDD6 Plan Hazards	2021 JCDD6 Plan Update	Significance to Area (see definition below)
Avalanche	N/A	Does not occur in area	N/A
Dam Failure	Omitted	Dam Failure	LSUL
Drought	Omitted	Drought	EWUL
Earthquake	Omitted	Does not occur in area	N/A
Erosion	Omitted	Fully Mitigated	NMOL
Expansive Soils	Omitted	Does not occur in area	N/A
Extreme Cold	Did not discuss	Considered part of Winter weather	NWUL
Extreme Heat	Omitted	Combining Extreme Heat with Drought	EWUL
Flood	Flood	Flood	EEHH
Hail	Omitted	Fully Mitigated	NWUL
Hurricane	Hurricane/Tropical Storms	Hurricane/Tropical Storm	EEHH
Landslide	Omitted	Does not occur in area	N/A
Lightning	Omitted	Fully Mitigated	LMOL
Severe Thunderstorms/Wind	Severe Thunderstorms/Wind	Severe Thunderstorms/Wind	EEHH
Severe Winter Weather/Winter Storm	Omitted	Severe Winter Weather/Winter Storm	LMLM
Storm Surge	Discussed as part of H/TS	Include in H/TS	EEHH
Subsidence	Omitted	Does not occur in area	N/A
Tornado	Tornado	Tornado	LSLH
Tsunami	N/A	Does not occur in area	N/A
Wildfire	Omitted	Does not occur in area	N/A

Mitigation Strategy and Goals

The MPC reviewed the current mitigation goal as well as the State's 2018 Mitigation Goals. After that review and discussion, the team updated the goal as follows:

The creation of the Jefferson County Drainage District No. 6 ("the District") was to make drainage improvements in the jurisdictional boundaries it serves. This role was further expanded as a conservation and reclamation District allowing the District to further conserve the natural resources of the State and help to mitigate health and safety hazard. The continuing mission of the District is to provide flood damage reduction projects that work with appropriate regard for community and natural values. It is this mission and aligning this mission to the State's goals that drives the goals.

Therefore, the goal of this plan is to support the District's efforts to protect the community's health, safety, and welfare by identifying and increasing public awareness of natural hazards and mitigating risks due to those hazards without creating new problems. In addition, The District will work to:

- Protect public health, safety, and welfare and natural resources;
- To reduce losses due to hazards by identifying hazards, minimizing exposure of citizens and property to hazards, and increasing public awareness and involvement;
- To facilitate the development review and approval process to accommodate growth in a practical way that recognizes existing stormwater and floodplain problems while avoiding creating new problems or worsening existing problems;
- Reduce adverse environmental, natural resource, and economic impacts from natural, hazard events.
- Increase cooperation and coordination among private entities, local agencies, State agencies and Federal agencies

Discuss outreach strategy

The MPC needs input from diverse interests to help review and update its plan. The District will use its website, public notice, email and public meetings to reach out to these communities.

a. Stakeholders will be finalized and then a letter from the District to the Stakeholders requesting their input to the draft, and how to provide that input back to the MPC.

b. Public Meeting 1 on November 9th. To ensure citizens understand what the District is doing on their behalf, and to provide a chance for input on community vulnerabilities and mitigation activities that will inform the plan's content. This public meeting is also an opportunity to educate the public about hazards and risks in the community, types of activities to mitigate those risks, and how these impact them as well as explain the process for the draft and the timeline for draft completion and public review.

Existing plans, studies, reports and technical information that can support mitigation planning

The team discussed reports and studies that have occurred in the last five years or have relevance to mitigation planning and will review. The studies that were deemed relevant will be distributed to the team for review and incorporation.

Document/map request/building inventory/permit information

The team discussed the need for permit information on new construction, demolitions and renovations as well as how many buildings in the City in the planning area and County – broken out by residential, commercial and Public/City buildings (if possible) for the last five years and the data needed to update the maps that will be included in the plan update.

A request for information and documents was provided:

Describe Hazard impacts since last plan (2017-2021)

- Tropical Storm Harvey –will provide detail descriptions of impact

District will provide the following Maps:

- RL properties in relation to the floodplain
- SRL properties in relation to the floodplain
- Both RL and SRL properties in relation to the floodplain

Tentative Schedule

A tentative schedule was provided as guidance to the team, subject to change as plan progresses.

Date	Description
9-24-21	Roles and responsibilities outlined Review of data needed and assignment of lead Review of current plan: Hazards, goals, current actions, development changes; review of plans or reports for inclusion in plan. Determine changes to hazards, goals and current actions and to discuss new actions District facilities reviewed Discuss stakeholders
9-30-21	Current Actions updated finalized New Actions to be discussed Local capabilities finalized Local Development update finalized District facilities finalized Finalize Stakeholders
10-22-21	New Actions finalized Plan maintenance process finalized Hazard Ranking, Actions finalized
11-1-21	Draft to MPC for review
11-9-21	First Public Meeting
11-19-21	Data collections and review. Comments from first public meeting incorporated; updating all sections after meeting
11-30-21	Letters to stakeholders drafted, second draft review
11-30-21	Stakeholders contacted regarding public meeting and providing process for providing comments from review
12-14-21	Second Public Meeting

Date	Description
12-14-21	Plan uploaded to District Website; Public given 30 days to review and provide comments
1-14-22	Comment cycle closes and comments incorporated
1-15-22	Plan is finalized to be sent to TDEM for review process

ACTION ITEMS TABLE DUE ON OR BEFORE OCTOBER 30th

ACTION	TEAM MEMBER
Stakeholder information	CO
Hazard profile draft	DW/KT
Provide requested studies	DC
Provide building data	CO
Maps	RR
Harvey Impact description	KS
Grants	KS
Rain Gauge data	CO
LNVA discussion	DC
Request current Claims information	DC
Send maps to update	DW

Jefferson County Drainage District No. 6
Hazard Mitigation Plan Update MPC Meeting 2
September 30, 2021, 9:00 am CST Meeting Minutes

MPC Attendees

Attendees	Department
Doug Canant	District Engineer, Engineering Department, JCDD6
Karen Stewart	Chief Business Officer, Procurement Department, JCDD6
Chuck Oakley	Chief Financial Officer, Finance Department, JCDD6
Kristen Thatcher	Plan Consultant, JSWA
Dan Ward	Plan Consultant, JSWA

Review Actions in Current Plan for Update

The MPC reviewed the actions from the current plan provided an update to the actions. If any action from the current plan indicated complete, it was noted in the status and will be removed the mitigation action table and prioritization. The same process occurred for actions that were recommended to be removed.

New Actions

Using the identified hazards and risk assessment, the team discussed what new actions should be included based on the primary types of mitigation actions:

- Local plans and regulations,
- Structure and infrastructure projects,
- Natural systems protection, and
- Education and awareness programs

District Capabilities

The Capability Assessment describes the tools and staff the District's has to implement mitigation actions to reduce disaster losses and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects. These tools can be grouped into the following categories: planning and regulatory, administrative and technical, financial, and education and outreach. The District updated its current staffing needs and current capabilities and discussed areas where additional staff or tools could be helpful.

District Facilities

The District reviewed the current plan's list of District facilities buildings, maps and District assets and updated each.

Finalized stakeholder group

A final stakeholders list was distributed.

Schedule

A revised schedule was provided as guidance to the team, subject to change as plan progresses.

Date	Description
9-24-21	Roles and responsibilities outlined Review of data needed and assignment of lead Review of current plan: Hazards, goals, current actions, development changes; review of plans or reports for inclusion in plan. Determine changes to hazards, goals and current actions and to discuss new actions District facilities reviewed

Date	Description
	Discuss stakeholders
9-30-21	Current Actions updated finalized New Actions to be discussed Local capabilities finalized Local Development update finalized District facilities finalized Finalize Stakeholders
10-22-21	New Actions finalized Plan maintenance process finalized Hazard Ranking, Actions finalized
11-1-21	Draft to MPC for review
11-5-21	MPC Meeting to review presentation and draft plan
11-9-21	First Public Meeting
11-16-21	Data collections and review. Comments from first public meeting incorporated; updating all sections after meeting
11-18-21	Letters to stakeholders sent with draft
11-23-21	Second Public Meeting
11-23-21	Plan uploaded to District Website; Public given 30 days to review and provide comments
12-23-21	Comment cycle closes and comments incorporated
12-28-21	Plan is finalized to be sent to TDEM for review process

ACTION ITEMS TABLE DUE ON OR BEFORE NEXT MEETING

ACTION	TEAM MEMBER
Draft of mitigation actions	DW/KT
Draft of current status	DW/KT
Provide building map update	KS
Permit information	DC
Insurance information for assets	CO

Jefferson County Drainage District No. 6
Hazard Mitigation Plan Update Conference Call
Friday, October 22, 2021, 11:00 am CST Meeting Minutes

MPC Attendees

Attendees	Department
Doug Canant	District Engineer, Engineering Department, JCDD6
Karen Stewart	Chief Business Officer, Procurement Department, JCDD6
Chuck Oakley	Chief Financial Officer, Finance Department, JCDD6
Butch Wilson	Assistant District Engineer, Engineering Department, JCDD6
Kristen Thatcher	Plan Consultant, JSWA
Dan Ward	Plan Consultant, JSWA

Mitigation Actions
The last meeting the team identified new actions. This meeting the MPC provided more detailed information regarding the actions including:

- Title
- If it were new or moved from current plan
- The hazard(s) the action would address
- The implementing department
- A cost estimate and potential funding source(s)
- The estimated timeframe for the work
- If the action
    - Reduced risk to existing buildings and infrastructure
    - Reduced risk to new development
- Some cost and benefit considerations to be considered for the action

Mitigation Action Prioritization
The team then took each of the actions and using the following evaluation criteria and definitions, scored each criteria (1 being lowest and 10 being highest). The results were tallied and the priority LOW, MEDIUM, HIGH, was assigned. The results are on page 3.

Plan Maintenance Process
The MPC discussed the current process. Each year the team meets to discuss the status of the plan and determine if any significant changes are warranted. In addition to annual meetings, the Business Manager convenes meetings after damage-causing natural hazard events to review the effects of such events. Based on those effects, adjustments to the mitigation priorities may be made or additional event-specific actions identified, as was the case in 2020 when the District added seven more actions to the current plan post Hurricane Harvey and again in 2021 after Hurricane Imelda where four more actions were added. The team agreed that the process works well, however, it will improve the process by periodically providing informational reviews with the public on the plan and working with agency partners (Beaumont, Jefferson County, Drainage Districts in the area, COG) to integrate this plan with other plans, programs and procedures.

Next Steps
Continued data collection, map updates and a draft will be prepared for next meeting.

Mitigation Action Evaluation Worksheet

Use this worksheet to help evaluate and prioritize each mitigation action being considered by the planning team. For each action, evaluate the potential benefits and/or likelihood of successful implementation for the criteria defined below.

Rank each of the criteria with a -1, 0 or 1 using the following scale:

- 1 = Highly effective or feasible
- 0 = Neutral
- -1 = Ineffective or not feasible

Example Evaluation Criteria

Life Safety – How effective will the action be at protecting lives and preventing injuries?

Property Protection – How significant will the action be at eliminating or reducing damage to structures and infrastructure?

Technical – Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.

Political – Is there overall public support for the mitigation action? Is there the political will to support it?

Legal – Does the community have the authority to implement the action?

Environmental – What are the potential environmental impacts of the action? Will it comply with environmental regulations?

Social – Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?

Administrative – Does the community have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?

Local Champion – Is there a strong advocate for the action or project among local departments and agencies that will support the action's implementation?

Other Community Objectives – Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of the comprehensive plan?

Action No.	MITIGATION ACTION SUMMARY OF PRIORITIZATION TOTAL SCORE BETWEEN 1-50 HAZARD IS LOW PRIORITY (L) TOTAL SCORE BETWEEN 51-75 HAZARD IS MEDIUM PRIORITY (M) TOTAL SCORE BETWEEN 76-100 HAZARD IS HIGH PRIORITY (H)	Total	Priority
2	Create severe weather plan	99	**H**
3	Coordination with Local Partners on Flood Predictions and Recovery work	99	**H**
4	Engineering and Structural Survey on DD6 Facilities	99	**H**
6	Ditch 609 (South China Relief)	99	**H**
7	Amelia Cutoff Detention Diversion	99	**H**
8	Taylor's Bayou Project	99	**H**
9	Whites Ranch outfall structures	99	**H**
11	Borley Heights Outfall Channelization and NLVA canal crossing addition	99	**H**
12	Ditch 100-A	99	**H**
13	Blanchette Diversion	99	**H**
14	Tevis Street Diversion	99	**H**
15	South Park Diversion	99	**H**
16	Lucas Street Diversion	99	**H**
17	The Bayou Dinn Detention Basin	99	**H**
18	Nome Relief	99	**H**
19	East China Relief. Detain floodwaters on Taylors Bayou tributaries 600	99	**H**
20	West China Detention Relief. Detain floodwaters on Taylors Bayou tributaries 609	99	**H**
21	Ditch 505 Detention	99	**H**
22	Concrete line/earthen channel ditch assessment	99	**H**
23	Concrete line ditch repair	99	**H**
24	Pursue Cost Effective Projects to eliminate Flooding in the District	99	**H**
25	New Master plan and Watershed Study	99	**H**
26	Tyrrell Park Detention II	99	**H**
27	North Cheek Relief	99	**H**
28	Ditch 117	99	**H**
29	Green Pond Detention East Detention	99	**H**
30	Delaware Street Detention	99	**H**
31	Virginia Street Detention	99	**H**
34	Fannin Diversion	99	**H**
1	Enhance DD6's internal GIS capabilities	81	**H**
5	Formalize Procedures for hazard event	78	**H**
10	Ditch 119 Crossings at Yount and Edson	73	**M**
32	Coordination efforts with USACE on Sam Rayburn Dam	50	**L**
33	Coordination efforts with USACE on Town Bluff Dam	50	**L**

Jefferson County Drainage District No. 6
Hazard Mitigation Plan Update Conference Call
Friday, November 5, 2021, 9:00 am CST Meeting Minutes

MPC Attendees

Attendees	Department
Doug Canant	District Engineer, Engineering Department, JCDD6
Karen Stewart	Chief Business Officer, Procurement Department, JCDD6
Kristen Thatcher	Plan Consultant, JSWA
Dan Ward	Plan Consultant, JSWA

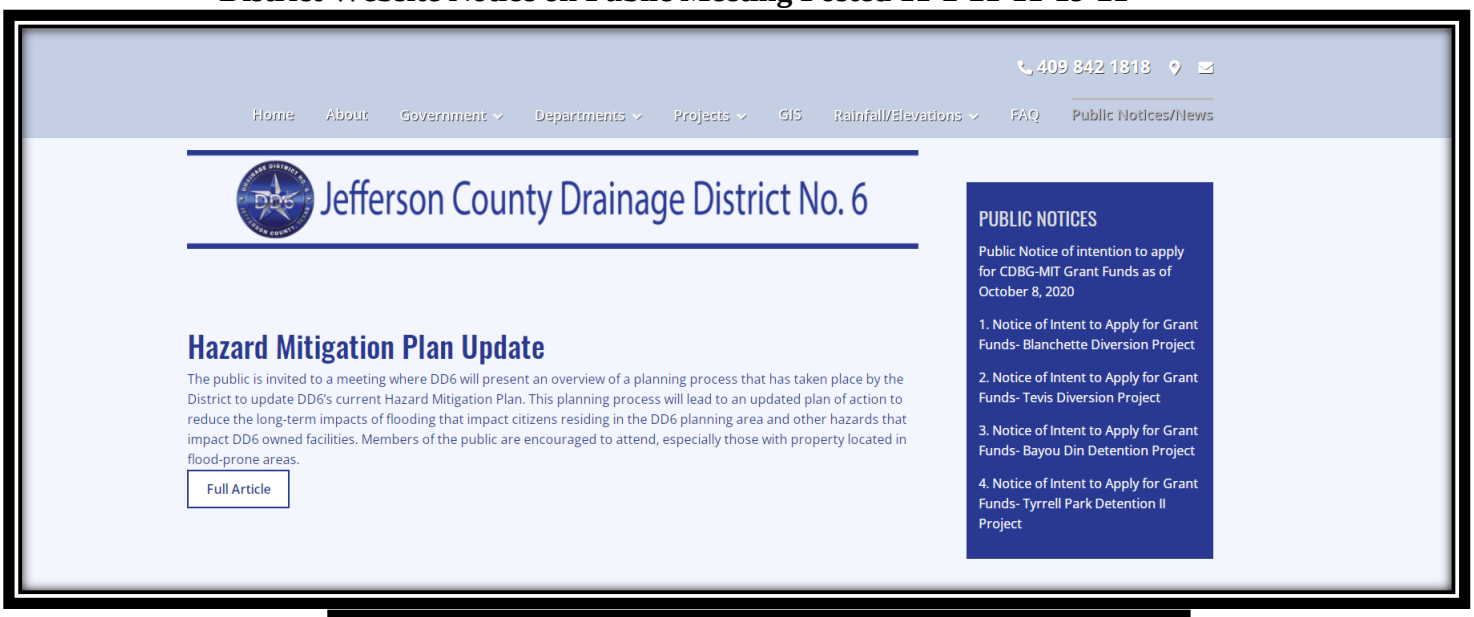
Reviewed Presentation for First Public Meeting
Presentation was reviewed and revisions made. First meeting is Tuesday, November 9, 2021, at 5 pm.

Review of First Draft of plan
Team reviewed the plan and will work through each section for review and revisions.

APPENDIX B

Public Notice and Website Announcement of First Meeting

District Website Notice on Public Meeting Posted 11-2-21-11-19-21



Notice of Plan Update
Jefferson County Drainage District No. 6 (DD6)
Hazard Mitigation Plan Update

The public is invited to a meeting where DD6 will present an overview of a planning process that has taken place by the District to update DD6' current Hazard Mitigation Plan. This planning process will lead to an updated plan of action to reduce the long-term impacts of flooding that impact citizens residing in the DD6 planning area and other hazards that impact DD6 owned facilities. Members of the public are encouraged to attend, especially those with property located in flood-prone areas.

This meeting will be held on November 9, 2021 at 5 PM, at DD6 Administration Offices located at:

6550 Walden Road
Beaumont, TX 77707-5510

The plan update is required by the Federal Emergency Management Agency (FEMA) for DD6 to remain eligible for certain types of federal grants. The plan update will provide an overview of natural hazards in the District, a summary of past hazard events, and describe how the District recognizes and addresses hazards in the development process along with other District functions. The actions identified in this plan are intended to help protect the citizens, property, and natural environment throughout the District. Members of the public will be encouraged to comment on the draft plan update as it progresses.

Once the plan update is complete, the final hazard mitigation plan will be presented to the DD6 Board for adoption later this year. Any additional public meetings will be scheduled before then to present the draft recommendations and request additional comment from interested citizens.

Questions about the plan should be directed to Mitigation Plan Consultant, JSWA at kthatcher@rstarmail.com. You can also contact Karen J. Stewart at (409) 842-1818.

BEAUMONT ENTERPRISE PUBLIC NOTICE

SPORTS

Legal Notices

Legals/Public Notices

Notice of Plan Update
Jefferson County Drainage District No. 6 (DD6)
Hazard Mitigation Plan Update

The public is invited to a meeting where DD6 will present an overview of a planning process that has taken place by the District to update DD6' current Hazard Mitigation Plan. This planning process will lead to an updated plan of action to reduce the long-term impacts of flooding that impact citizens residing in the DD6 planning area and other hazards that impact DD6 owned facilities. Members of the public are encouraged to attend, especially those with property located in flood-prone areas.

This meeting will be held on November 9, 2021 at 5 PM, at DD6 Administration Offices located at:

6550 Walden Road
Beaumont, TX 77707-5510

The plan update is required by the Federal Emergency Management Agency (FEMA) for DD6 to remain eligible for certain types of federal grants. The plan update will provide an overview of natural hazards in the District, a summary of past hazard events, and describe how the District recognizes and addresses hazards in the development process along with other District functions. The actions identified in this plan are intended to help protect the citizens, property, and natural environment throughout the District. Members of the public will be encouraged to comment on the draft plan update as it progresses.

Once the plan update is complete, the final hazard mitigation plan will be presented to the DD6 Board for adoption later this year. Any additional public meetings will be scheduled before then to present the draft recommendations and request additional comment from interested citizens.

Questions about the plan should be directed to Mitigation Plan Consultant, JSWA at kthatcher@rstarmail.com. You can also contact Karen J. Stewart at (409) 842-1818.

Legals/Public Notices

Notice Of Sale Pursuant to Chapter 59
Texas Property Code, Notice is hereby given that the undersigned will sell at public auction, to satisfy the lien of the owner, personal property belonging to those individuals listed. Bidding takes place on www.lockerfox.com ending on Thursday the 18th day of November, 2021 at 10:00 AM with cash payment and pick-up at Purely Storage - Beaumont 1, 6045 College Street, Beaumont, TX, 77707 Walker, Ernest unit B114R. Walker, Ernest unit B064R. Padilla, Rose unit 0459. Adekunle, Adebodun unit 0155. Jackson, Derlin unit 0130. Lazard, Jeffery unit 0249. Brent, Clarissa unit 0310. Dowers, Mallory unit 0378. Allen, Aaron unit 0061. Medina, Daniel unit 0171. Berry, Justin unit 0240. Smith, Bianca unit 0239. Barnett, Ashley unit 0279. Shoaf, Kristopher unit 0008. Hennigan, Brandy unit 0397. Smith, Gerald unit C22. Randle, Dawn unit 0223. Alvizo, Gabriel unit 0016. Barlow, Sylvia unit 0075. Thomas, Lester unit 0168. Aragon, Nicole unit 0201. Kinney, Cathy unit 0347. Nelson, Jacob unit 0496. Jones, Michelle unit 0336. Godfrey, Jakadriane unit 0451. Slaughter, Skylar unit 0501. Ruben, Ryan unit 0471. Evans, Leonard unit 0479. Mcgahan, Tony unit 0550. Leroy, Daniel unit 0363. Gallien, Toyed unit 0487. Jordan, Sara unit 0374. The property consists of household goods, furniture, clothing, toys, sporting goods, and miscellaneous. Purely Storage may refuse any bid and may rescind any purchase up until the winning bidder takes possession of the personal property.

Legal Bids & Proposals

Notice Of Sale Pursuant to Chapter 59
Texas Property Code, Notice is hereby given that the undersigned will sell at public auction, to satisfy the lien of the owner, personal property belonging to those individuals listed. Bidding takes place on www.lockerfox.com ending on Thursday the 18th day of November, 2021 at 11:00 AM with cash payment and pick-up at Purely Storage - Beaumont 2, 210 Interstate 10, Beaumont, TX, 77707 Roberts, Reed unit 402. Babino, Craig unit 156. McNeil, Jennifer unit 085. Andrus, Carmetria unit 220. Blount, Marsie unit

BEAUMONT ENTERPRISE PUBLISHER'S AFFIDAVIT

AFFIDAVIT OF PUBLICATION

STATE OF TEXAS:

Before me, the undersigned authority, a Notary Public in and for the State of Texas, on this day personally appeared, the Newspaper Representative at the BEAUMONT ENTERPRISE, a daily newspaper published in Jefferson County, Texas and generally circulated in the Counties of: JEFFERSON, HARDIN, TYLER, NEWTON, ORANGE, JASPER, LIBERTY, SABINE, CHAMBERS, SAN AUGUSTINE, ANGELINA, and GALVESTON and that the publication, of which the annexed herein, or attached to, is a true and correct copy, was published to-wit:

JEFFERSON COUNTY DRAINAGE D 0034160570 BEA093793103
RAN A LEGAL NOTICE
SIZE BEING: 1 x65 L

Product	Date	Class	Page
BEA Beaumont Enterprise	Nov 4 2021	Legal Notices	B 4
BEA Beaumont Enterprise	Nov 4 2021	Legal Notices	B 4
BEA Beaumont Enterprise	Nov 4 2021	Legal Notices	B 4
BEA Beaumont Enterprise	Nov 4 2021	Legal Notices	B 4
BEA Beaumont Enterprise	Nov 4 2021	Legal Notices	B 4
BEA Beaumont Enterprise	Nov 4 2021	Legal Notices	B 4
BEA Beaumont Enterprise	Nov 4 2021	Legal Notices	B 4

Product	Date	Class	Page

Victoria Bond & IR Clerk
NEWSPAPER REPRESENTATIVE

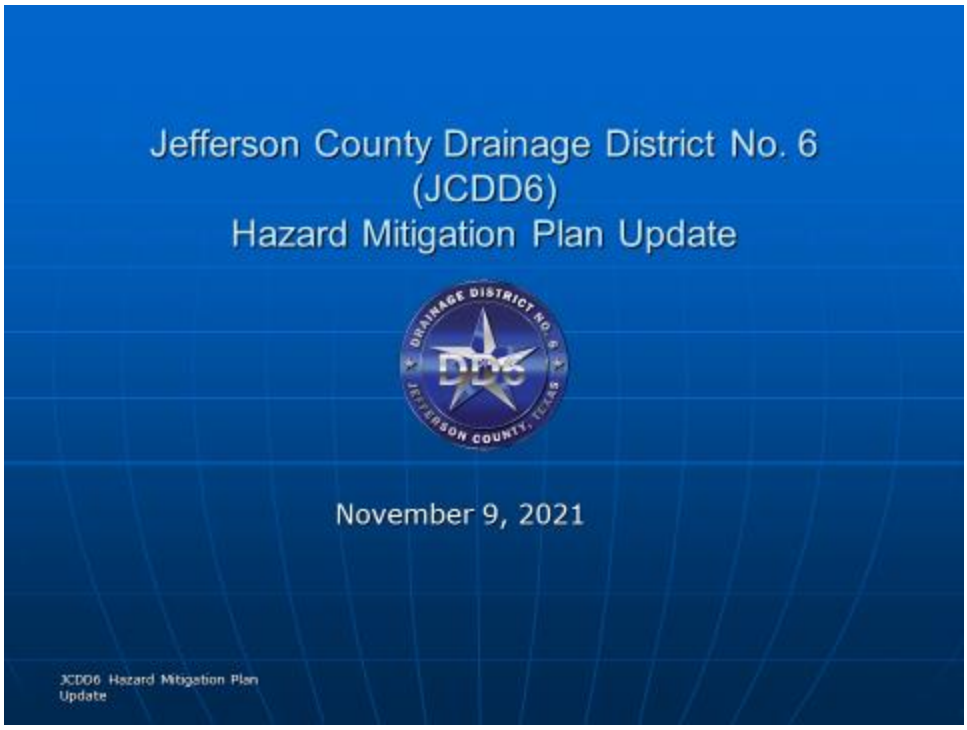
Sworn and subscribed to before me, this 4th Day of November A.D. 2021

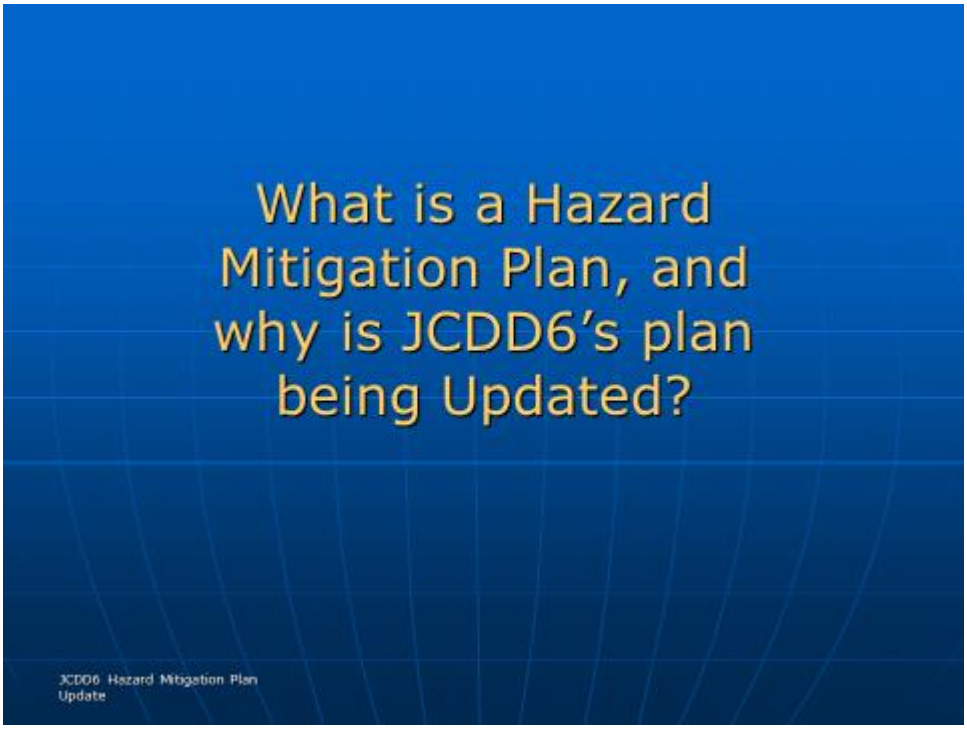
DELILAH METZGER 13823618 NOTARY PUBLIC STATE OF TEXAS EXPIRES MAY 19, 2022

Notary Public in and for the State of Texas

APPENDIX C

Presentation from November 9 Public Meeting


Jefferson County Drainage District No. 6
(JCDD6)
Hazard Mitigation Plan Update
November 9, 2021
JCDD6 Hazard Mitigation Plan Update


What is a Hazard Mitigation Plan, and why is JCDD6's plan being Updated?
JCDD6 Hazard Mitigation Plan Update


Mitigation Plan Update
5-year cyclical update is a Federal requirement to stay eligible for many kinds of disaster assistance
Understand and re-analyze risks
Provides opportunity to update all plan sections
District priorities for goals and actions and to reduce risk
Mitigation Planning Committee (MPC) leads the planning efforts with support from the public and community stakeholders
JCDD6 Hazard Mitigation Plan Update


Revised Plan Layout with this Update
Section 1. Introduction and Adoption
Section 2. The Planning Process
Section 3. Hazard Identification and Risk Assessment
Section 4. Mitigation Strategy
Status of Actions from Last Plan
New Actions
Section 5. Plan Maintenance Process
Appendices
JCDD6 Hazard Mitigation Plan Update

Plan Update Process

MPC Reviewed Hazards to determine significance to JCDD6 jurisdictional boundaries

Location	Maximum Probable Event	Likelihood of Occurrence	Overall Significance
N, L, S, E	W, M, S, E	U, O, L, H	L, M, H

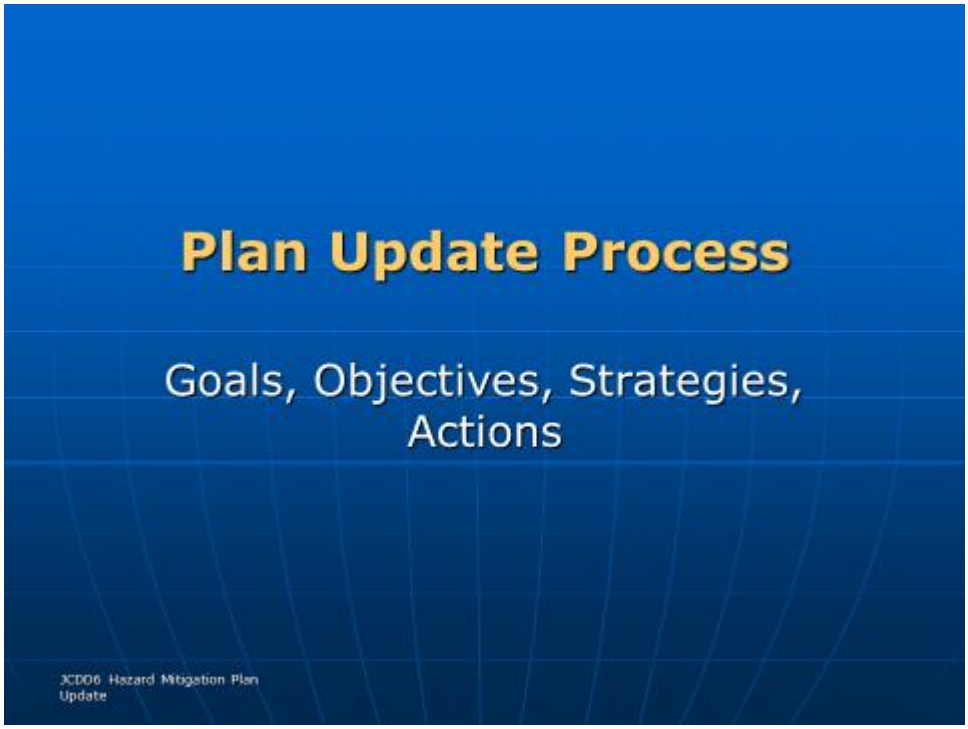
JCDD6 Hazard Mitigation Plan Update

Review determined the Hazards to be Profiled as part of Plan Update

- Dam Failure
- Drought/Extreme Heat
- Flood
- Hurricanes and Tropical Storms
- Severe Thunderstorms - High Wind
- Tornadoes
- Winter storm

JCDD6 Hazard Mitigation Plan Update


Review determined the Hazards That MPC recommends not be included in Plan Update (Does not occur in Area or Fully Mitigated)
Avalanche
Tsunami
Wildfire
Earthquake
Subsidence
Landslides
Expansive Soils
Erosion
Hail
Lightning
Extremes (Heat and Cold)
JCDD6 Hazard Mitigation Plan Update


Plan Update Process
Goals, Objectives, Strategies, Actions
JCDD6 Hazard Mitigation Plan Update

Plan Update Process –Draft revised Goal

The creation of the Jefferson County Drainage District No. 6 ("the District") was to make drainage improvements in the jurisdictional boundaries it serves. This role was further expanded as a conservation and reclamation District allowing the District to further conserve the natural resources of the State and help to mitigate health and safety hazard. The continuing mission of the District is to provide flood damage reduction projects that work with appropriate regard for community and natural values. It is this mission and aligning this mission to the State's goals that drives the goals.

Therefore, the goal of this plan is to support the District's efforts to protect the community's health, safety, and welfare by identifying and increasing public awareness of natural hazards, and mitigating risks due to those hazards without creating new problems. In addition, The District will work to:

protect public health, safety, and welfare and natural resources;

- To reduce losses due to hazards by identifying hazards, minimizing exposure of citizens and property to hazards, and increasing public awareness and involvement;
- To facilitate the development review and approval process to accommodate growth in a practical way that recognizes existing stormwater and floodplain problems while avoiding creating new problems or worsening existing problems; and
- Reduce adverse environmental, natural resource, and economic impacts from natural, hazard events.
- Increase cooperation and coordination among private entities, local agencies, State agencies and Federal agencies

JCDD6 Hazard Mitigation Plan Update

Plan Update Process

- Process provides for a status of current actions
  - Completed/Not Completed
  - Priority Change
  - Move to New actions for update
- Process offers an opportunity to put additional "actions" into the plan

JCDD6 Hazard Mitigation Plan Update

Mitigation Strategy and Actions

- The Mitigation Strategy describes how JCDD6 will accomplish the overall purpose of the planning process

Where we are now...

- All sections of the plan are complete in draft (see binder)
- Update and re-evaluation of Hazard Identification complete
- Risk assessment complete
- Discussion with public and stakeholders on hazards, impact and actions

Next Steps

- Mitigation Planning Committee (MPC) and Stakeholders to review initial draft
- Incorporate comments and changes into draft plan and present plan to submit to the Public for review (December). 30 Days to review
- Incorporate Stakeholder/Public Comments and submit to TDEM/FEMA for review (January)
- Incorporate TDEM/FEMA comment for APA – Approved Pending Adoption
- Adopt the plan update

Mitigation Actions

- Mitigation Actions reduce or eliminate long-term risk and are different from actions taken to prepare or respond to hazard events.
- Five Mitigation action types:
  - Local Plans and Regulations
  - Structure and Infrastructure Projects
  - Natural Systems Protections
  - Education and awareness
  - Initiatives
- Every hazard needs at least two actions

Mitigation Actions

- 34 actions
- Prioritized
- Action Info.
  - Hazard
  - Description
  - Department Lead
  - Cost estimate
  - Potential funding
  - Timeframe
  - Priority
  - Risk Focus
  - Cost/Benefit considerations

MITIGATION ACTION SUMMARY OF PRIORITIZATION

TOTAL SCORE BETWEEN 1-50 HAZARD IS LOW PRIORITY [L]
TOTAL SCORE BETWEEN 51-75 HAZARD IS MEDIUM PRIORITY [M]
TOTAL SCORE BETWEEN 76-100 HAZARD IS HIGH PRIORITY [H]

Action No.	Action	Total	Priority
2	Create severe weather plan	99	H
3	Coordination with Local Partners on Flood Predictions and Recovery work	99	H
4	Engineering and Structural Survey on DD6 Facilities	99	H
6	Ditch 609 (South China Relief)	99	H
7	Amelia Cutoff Detention Diversion	99	H
8	Taylor's Bayou Project	99	H
9	Whites Ranch outfall structures	99	H
11	Berley Heights Outfall Channelization and N.L.W.A. canal crossing addition	99	H
12	Ditch 100-A	99	H
13	Blanchette Diversion	99	H
14	Tevis Street Diversion	99	H
15	South Park Diversion	99	H
16	Lucas Street Diversion	99	H
17	The Bayou Dies Detention Basin	99	H
18	Norse Relief	99	H
19	East China Relief. Detain floodwaters on Taylors Bayou tributaries 600	99	H
20	West China Detention Relief. Detain floodwaters on Taylors Bayou tributaries 609	99	H
21	Ditch 505 Detention	99	H
22	Concrete lined ditch assessment	99	H
23	Concrete lined ditch repair	99	H
24	Pursue Cost Effective Projects to eliminate flooding in the District	99	H
25	New Master plan and Watershed Study	99	H
26	Tyrrell Park Detention II	99	H
27	North Cheek Relief	99	H
28	Ditch 117	99	H
29	Green Pond Detention East Detention	99	H
30	Delaware Street Detention	99	H
31	Virginia Street Detention	99	H
34	Fannin Diversion	99	H
1	Enhance DD6's internal GIS capabilities	81	H
5	Formalize Procedures for hazard event	78	H
10	Ditch 119 Crossings at Yount and Edson	73	M
32	Coordination efforts with USACE on Sam Rayburn Dam	50	L
33	Coordination efforts with USACE on Town Bluff Dam	50	L

Questions and Comments

Point of Contact
Kristen Thatcher
JSWA
kthatcher@rstarmail.com

APPENDIX D

Example of Stakeholder Letter

Jefferson County
Drainage District No. 6
6550 Walden Rd. • Beaumont, Texas 77707
Telephone (409) 842-1818
Fax (409) 842-2729
Established in 1920

November 18, 2021

Mr. Randall Reese
Sabine Neches Navigation District
8180 Anchor Drive
Port Arthur, TX 77642

Re: Jefferson County Drainage District No. 6, Hazard Mitigation Plan

Update Dear Mr. Reese:

As you may be aware, Jefferson County Drainage District No. 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organization should include business, academia, and other private and non-profit interests.

Your organization has been identified by the District as one that could be impacted by the mitigation actions and strategy and therefore, the District would like to invite you to be one of its stakeholders. If you accept, the District has provided a Dropbox link below to download the draft for review. In addition, if you would like to provide information to be reviewed for possible inclusion in the update, please provide that information directly to our plan consultant, JSWA, attention: Kristen Thatcher (kthatcher@rstarmail.com) and Dan Ward (dan.jswa@outlook.com).

Click for Draft Hazard Mitigation Plan Update

Comments will be considered by the Mitigation Planning Committee and incorporated as appropriate. The District asks that you please review and provide your comments back **by December 23, 2021** in order to give enough time to incorporate the comments into the draft.

Thank you very much for considering this request. It is important that stakeholders and the public have an opportunity to review and comment.

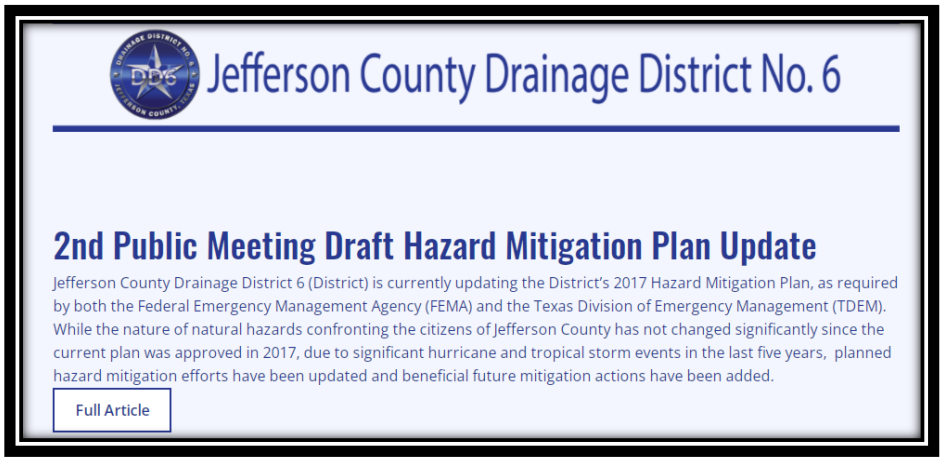
Sincerely,

Karen J. Stewart, MBA, CTCD
Chief Business Officer

Drainage, Storm Water Management, Flood Control, Reclamation and Conservation.

APPENDIX E

Public Notice for Second Public Meeting 11-23-21



Public Notice

Jefferson County Drainage District 6 (District) is currently updating the District's 2017 Hazard Mitigation Plan, as required by both the Federal Emergency Management Agency (FEMA) and the Texas Division of Emergency Management (TDEM). While the nature of natural hazards confronting the citizens of Jefferson County has not changed significantly since the current plan was approved in 2017, due to significant hurricane and tropical storm events in the last five years, planned hazard mitigation efforts have been updated and beneficial future mitigation actions have been added.

The public is invited to attend a public meeting which will include a presentation describing the Draft Hazard Mitigation Plan Update held on November 23, 2021 at 5 PM, at JCDD6 Administration Offices located at:

6550 Walden Road
Beaumont, TX 77707-5510

The District will publicly make available the Draft Hazard Mitigation Plan Update at https://dd6.org/public-notices-news/ on November 23, 2021 and begin a 30-day public comment period during which community members, and businesses are encouraged to review the draft and provide comments prior to finalizing the update. Public comments can be submitted to the District's Consultant, JSWA and Associates at the following email address: kthatcher@rstarmail.com or dan.jswa@outlook.com through December 23, 2021.

All comments received in the comment period will be reviewed for incorporation into the Final Hazard Mitigation Plan Update, and then the finalized document will be submitted to TDEM and FEMA for review and approval. Upon FEMA notification of approval, the Hazard Mitigation Plan Update will be presented to the Board of Directors for formal adoption, after which it will remain valid for five years. Questions regarding this important preparedness planning initiative can be directed to Karen J. Stewart, MBA, CTCD at kstewart@dd6.org.

1 pg
NPM

2021040402

Public Notice for Publication November 18, 2021

Jefferson County Drainage District 6 (District) is currently updating the District's 2017 Hazard Mitigation Plan, as required by both the Federal Emergency Management Agency (FEMA) and the Texas Division of Emergency Management (TDEM). While the nature of natural hazards confronting the citizens of Jefferson County has not changed significantly since the current plan was approved in 2017, due to significant hurricane and tropical storm events in the last five years, planned hazard mitigation efforts have been updated and beneficial future mitigation actions have been added.

The public is invited to attend a public meeting which will include a presentation describing the Draft Hazard Mitigation Plan Update held on November 23, 2021 at 5 PM, at JCDD6 Administration Offices located at:

6550 Walden Road
Beaumont, TX 77707-5510

The District will publicly make available the Draft Hazard Mitigation Plan Update at https://dd6.org/public-notices-news/ on November 23, 2021 and begin a 30-day public comment period during which community members, and businesses are encouraged to review the draft and provide comments prior to finalizing the update. Public comments can be submitted to the District's Consultant, JSWA and Associates at the following email address: kthatcher@rstarmail.com or dan.jswa@outlook.com through December 23, 2021.

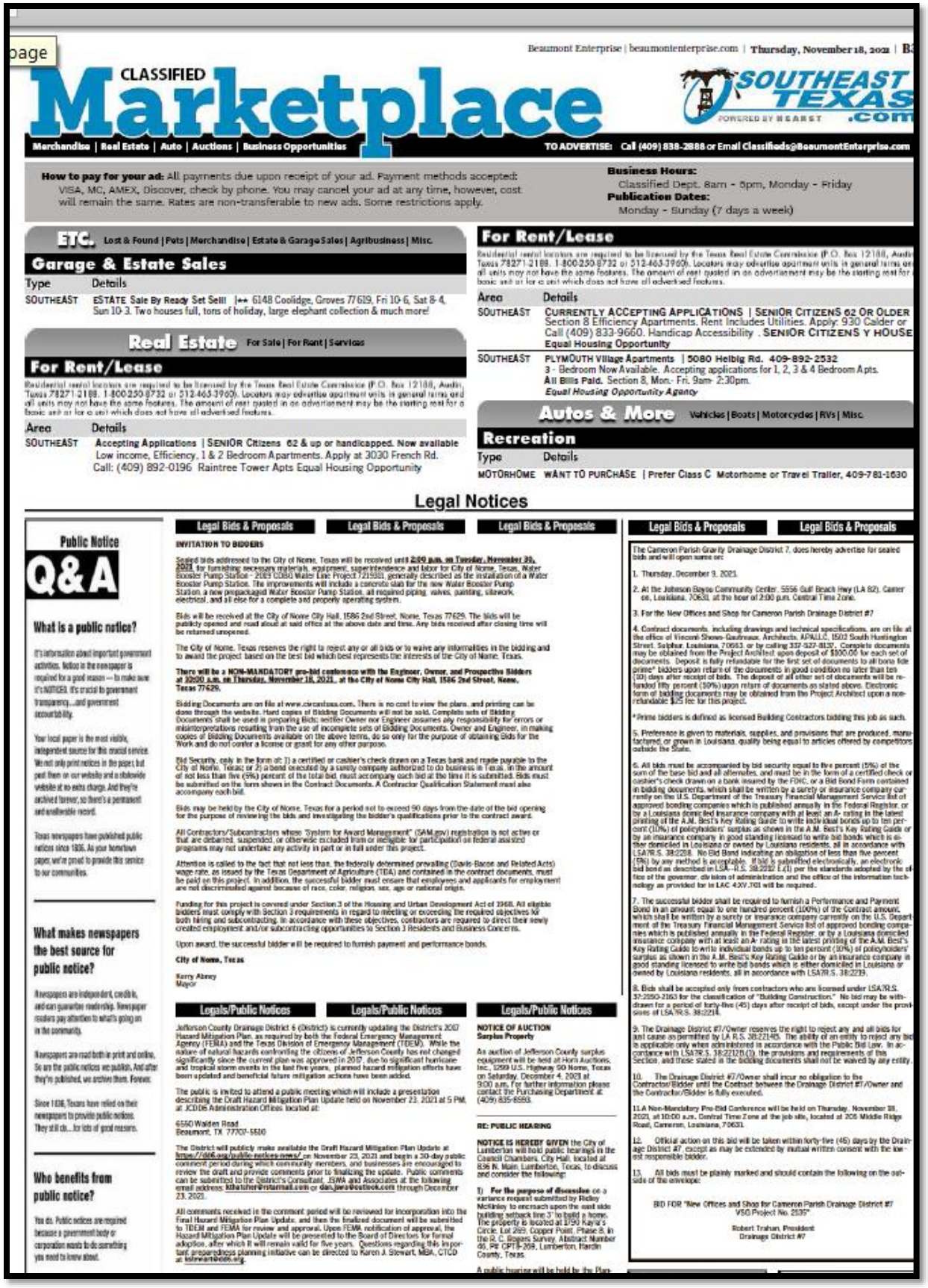
All comments received in the comment period will be reviewed for incorporation into the Final Hazard Mitigation Plan Update, and then the finalized document will be submitted to TDEM and FEMA for review and approval. Upon FEMA notification of approval, the Hazard Mitigation Plan Update will be presented to the Board of Directors for formal adoption, after which it will remain valid for five years. Questions regarding this important preparedness planning initiative can be directed to Karen J. Stewart, MBA, CTCD at kstewart@dd6.org.

Return To:

JEFFERSON COUNTY DRAINAGE DISTRICT
NO
6550 WALDEN ROAD
BEAUMONT, TX 77707

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS

Theresa Goodness, County Clerk
Jefferson County, Texas
November 17, 2021 04:40:05 PM
FEE: $0.00 2021040402



page

Beaumont Enterprise | beaumontenterprise.com | Thursday, November 18, 2021 | B

CLASSIFIED

Marketplace

SOUTHEAST TEXAS .com
POWERED BY HEARST

Merchandise | Real Estate | Auto | Auctions | Business Opportunities

TO ADVERTISE: Call (409) 838-2888 or Email Classifieds@BeaumontEnterprise.com

How to pay for your ad: All payments due upon receipt of your ad. Payment methods accepted: VISA, MC, AMEX, Discover, check by phone. You may cancel your ad at any time, however, cost will remain the same. Rates are non-transferable to new ads. Some restrictions apply.

Business Hours:
Classified Dept. 8am - 5pm, Monday - Friday
Publication Dates:
Monday - Sunday (7 days a week)

ETC. Lost & Found | Pets | Merchandise | Estate & Garage Sales | Agribusiness | Misc.

Garage & Estate Sales

Type	Details
SOUTHEAST	ESTATE Sale By Ready Set Sell! |++ 6148 Coolidge, Groves 77619. Fri 10-6, Sat 8-4, Sun 10-3. Two houses full, tons of holiday, large elephant collection & much more!

Real Estate For Sale | For Rent | Services

For Rent/Lease

Residential rental locators are required to be licensed by the Texas Real Estate Commission (P.O. Box 12188, Austin, Texas 78711-2188, 1-800-250-8732 or 512-465-3960). Locators may advertise apartment units in general terms and all units may not have the same features. The amount of rent quoted in an advertisement may be the starting rent for a basic unit or for a unit which does not have all advertised features.

Area	Details
SOUTHEAST	Accepting Applications	SENIOR Citizens 62 & up or handicapped. Now available Low income, Efficiency, 1 & 2 Bedroom Apartments. Apply at 3030 French Rd. Call: (409) 892-0196 Raintree Tower Apts Equal Housing Opportunity

For Rent/Lease

Residential rental locators are required to be licensed by the Texas Real Estate Commission (P.O. Box 12188, Austin, Texas 78711-2188, 1-800-250-8732 or 512-465-3960). Locators may advertise apartment units in general terms and all units may not have the same features. The amount of rent quoted in an advertisement may be the starting rent for a basic unit or for a unit which does not have all advertised features.

Area	Details
SOUTHEAST	CURRENTLY ACCEPTING APPLICATIONS	SENIOR CITIZENS 62 OR OLDER Section 8 Efficiency Apartments. Rent Includes Utilities. Apply: 930 Calder or Call (409) 833-9660. Handicap Accessibility . SENIOR CITIZENS Y HOUSE Equal Housing Opportunity
SOUTHEAST	PLYMOUTH Village Apartments	5080 Helbig Rd. 409-892-2532 3 - Bedroom Now Available. Accepting applications for 1, 2, 3 & 4 Bedroom Apts. All Bills Paid. Section 8, Mon.- Fri. 9am- 2:30pm. Equal Housing Opportunity Agency

Autos & More Vehicles | Boats | Motorcycles | RVs | Misc.

Recreation

Type	Details
MOTORHOME	WANT TO PURCHASE	Prefer Class C Motorhome or Travel Trailer, 409-781-1630

Legal Notices

Public Notice

Q&A

What is a public notice?

It's information about important government activities. Notice in the newspaper is required for a good reason — to make sure it's NOTICED. It's crucial to government transparency...and government accountability.

Your local paper is the most visible, independent source for this crucial service. We not only print notices in the paper, but post them on our website and a statewide website at no extra charge. And they're archived forever, so there's a permanent and available record.

Texas newspapers have published public notices since 1836. As your hometown paper, we're proud to provide this service to our communities.

What makes newspapers the best source for public notice?

Newspapers are independent, credible, and can guarantee readership. Newspaper readers pay attention to what's going on in the community.

Newspapers are read both in print and online. So are the public notices we publish. And after they're published, we archive them. Forever.

Since 1836, Texans have relied on their newspapers to provide public notices. They still do...for lots of good reasons.

Who benefits from public notice?

You do. Public notices are required because a government body or corporation wants to do something you need to know about.

Legal Bids & Proposals

INVITATION TO BIDDERS

Sealed bids addressed to the City of Nome, Texas will be received until **2:00 p.m. on Tuesday, November 30, 2021** for furnishing necessary materials, equipment, superintendence and labor for City of Nome, Texas, Water Booster Pump Station - 2019 CDBG Water Line Project 7215501, generally described as the installation of a Water Booster Pump Station. The improvements will include a concrete slab for the new Water Booster Pump Station, a new prepackaged Water Booster Pump Station, all required piping, valves, painting, sitework, electrical, and all else for a complete and properly operating system.

Bids will be received at the City of Nome City Hall, 1586 2nd Street, Nome, Texas 77629. The bids will be publicly opened and read aloud at said office at the above date and time. Any bids received after closing time will be returned unopened.

The City of Nome, Texas reserves the right to reject any or all bids or to waive any informalities in the bidding and to award the project based on the best bid which best represents the interests of the City of Nome, Texas.

There will be a NON-MANDATORY pre-bid conference with the Engineer, Owner, and Prospective Bidders at 10:00 a.m. on Thursday, November 18, 2021, at the City of Nome City Hall, 1586 2nd Street, Nome, Texas 77629.

Bidding Documents are on file at www.civcastusa.com. There is no cost to view the plans and printing can be done through the website. Hard copies of Bidding Documents will not be sold. Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents. Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other purpose.

Bid Security, only in the form of: 1) a certified or cashier's check drawn on a Texas bank and made payable to the City of Nome, Texas; or 2) a bond executed by a surety company authorized to do business in Texas, in the amount of not less than five (5%) percent of the total bid, must accompany each bid at the time it is submitted. Bids must be submitted on the form shown in the Contract Documents. A Contractor Qualification Statement must also accompany each bid.

Bids may be held by the City of Nome, Texas for a period not to exceed 90 days from the date of the bid opening for the purpose of reviewing the bids and investigating the bidder's qualifications prior to the contract award.

All Contractors/Subcontractors whose "System for Award Management" (SAM.gov) registration is not active or that are debarred, suspended, or otherwise excluded from or ineligible for participation on federal assisted programs may not undertake any activity in part or in full under this project.

Attention is called to the fact that not less than the federally determined prevailing (Davis-Bacon and Related Acts) wage rate, as issued by the Texas Department of Agriculture (TDA) and contained in the contract documents, must be paid on this project. In addition, the successful bidder must ensure that employees and applicants for employment are not discriminated against because of race, color, religion, sex, age or national origin.

Funding for this project is covered under Section 3 of the Housing and Urban Development Act of 1968. All eligible bidders must comply with Section 3 requirements in regard to meeting or exceeding the required objectives for both hiring and subcontracting. In accordance with these objectives, contractors are required to direct their newly created employment and/or subcontracting opportunities to Section 3 Residents and Business Concerns.

Upon award, the successful bidder will be required to furnish payment and performance bonds.

City of Nome, Texas

Kerry Abney
Mayor

Legals/Public Notices

Jefferson County Drainage District 6 (District) is currently updating the District's 2007 Hazard Mitigation Plan, as required by both the Federal Emergency Management Agency (FEMA) and the Texas Division of Emergency Management (TDEM). While the nature of natural hazards confronting the citizens of Jefferson County has not changed significantly since the current plan was approved in 2017, due to significant hurricane and tropical storm events in the last five years, planned hazard mitigation efforts have been updated and beneficial future mitigation actions have been added.

The public is invited to attend a public meeting which will include a presentation describing the Draft Hazard Mitigation Plan Update held on November 23, 2021 at 5 PM, at JCDD6 Administration Offices located at:

6550 Walden Road
Beaumont, TX 77707-5610

The District will publicly make available the Draft Hazard Mitigation Plan Update at https://dd6.org/public-notices-news/ on November 23, 2021 and begin a 30-day public comment period during which community members, and businesses are encouraged to review the draft and provide comments prior to finalizing the update. Public comments can be submitted to the District's Consultant, ESWA and Associates at the following email address: kthatcher@eswamail.com or dan_pea@outlook.com through December 23, 2021.

All comments received in the comment period will be reviewed for incorporation into the Final Hazard Mitigation Plan Update, and then the finalized document will be submitted to TDEM and FEMA for review and approval. Upon FEMA notification of approval, the Hazard Mitigation Plan Update will be presented to the Board of Directors for formal adoption, after which it will remain valid for five years. Questions regarding this important preparedness planning initiative can be directed to Karen J. Stewart, MBA, CTCD at kstewart@dd6.org.

Legals/Public Notices

NOTICE OF AUCTION
Surplus Property

An auction of Jefferson County surplus equipment will be held at Horn Auctions, Inc., 1299 U.S. Highway 90 Nome, Texas on Saturday, December 4, 2021 at 9:00 a.m. For further information please contact the Purchasing Department at (409) 835-8593.

RE: PUBLIC HEARING

NOTICE IS HEREBY GIVEN the City of Lumberton will hold public hearings in the Council Chambers, City Hall, located at 836 N. Main, Lumberton, Texas, to discuss and consider the following:

1) **For the purpose of discussion** on a variance request submitted by Ricky McKinley to encroach upon the east side building setback line 3' to build a home. The property is located at 3790 Kayla's Circle, Lot 269, Cooper Point, Phase 8, in the R. C. Rogers Survey, Abstract Number 66, Pct CP18-269, Lumberton, Hardin County, Texas.

A public hearing will be held by the Plan

Legals/Public Notices

The Cameron Parish Gravity Drainage District 7, does hereby advertise for sealed bids and will open same on:

1. Thursday, December 9, 2021.

2. At the Johnson Bayou Community Center, 5556 Gulf Beach Hwy (LA 82), Cameron, Louisiana, 70631, at the hour of 2:00 p.m. Central Time Zone.

3. For the New Offices and Shop for Cameron Parish Drainage District #7

4. Contract documents, including drawings and technical specifications, are on file at the office of Vincent Shows-Gautreaux, Architects, APAILLC, 1502 South Huntington Street, Sulphur, Louisiana, 70663, or by calling 337-527-8132. Complete documents may be obtained from the Project Architect upon deposit of $300.00 for each set of documents. Deposit is fully refundable for the first set of documents to all bona fide prime* bidders upon return of the documents in good condition no later than ten (10) days after receipt of bids. The deposit of all other set of documents will be refunded fifty percent (50%) upon return of documents as stated above. Electronic form of bidding documents may be obtained from the Project Architect upon a non-refundable $25 fee for this project.

*Prime bidders is defined as licensed Building Contractors bidding this job as such.

5. Preference is given to materials, supplies, and provisions that are produced, manufactured, or grown in Louisiana, quality being equal to articles offered by competitors outside the State.

6. All bids must be accompanied by bid security equal to five percent (5%) of the sum of the base bid and all alternates, and must be in the form of a certified check or cashier's check drawn on a bank insured by the FDIC, or a Bid Bond Form contained in bidding documents, which shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent (10%) of policyholders' surplus as shown in the A.M. Best's Key Rating Guide or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents, all in accordance with LSA?R.S. 38:2218. No Bid Bond indicating an obligation of less than five percent (5%) by any method is acceptable. If bid is submitted electronically, an electronic bid bond as described in LSA - R.S. 38:2212 E.(1) per the standards adopted by the office of the governor, division of administration and the office of the information technology as provided for in LAC 43V.701 will be required.

7. The successful bidder shall be required to furnish a Performance and Payment Bond in an amount equal to one hundred percent (100%) of the Contract amount, which shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent (10%) of policyholders' surplus as shown in the A.M. Best's Key Rating Guide or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents, all in accordance with LSA?R.S. 38:2219.

8. Bids shall be accepted only from contractors who are licensed under LSA?R.S. 37:2150-2163 for the classification of "Building Construction." No bid may be withdrawn for a period of forty-five (45) days after receipt of bids, except under the provisions of LSA?R.S. 38:2214.

9. The Drainage District #7/Owner reserves the right to reject any and all bids for just cause as permitted by LA R.S. 38:2212(B). The ability of an entity to reject any bid is applicable only when administered in accordance with the Public Bid Law. In accordance with LSA?R.S. 38:2212(B)(10), the provisions and requirements of this Section, and those stated in the bidding documents shall not be waived by any entity.

10. The Drainage District #7/Owner shall incur no obligation to the Contractor/Bidder until the Contract between the Drainage District #7/Owner and the Contractor/Bidder is fully executed.

11. A Non-Mandatory Pre-Bid Conference will be held on Thursday, November 18, 2021, at 10:00 a.m. Central Time Zone at the job site, located at 205 Middle Ridge Road, Cameron, Louisiana, 70631.

12. Official action on this bid will be taken within forty-five (45) days by the Drainage District #7, except as may be extended by mutual written consent with the lowest responsible bidder.

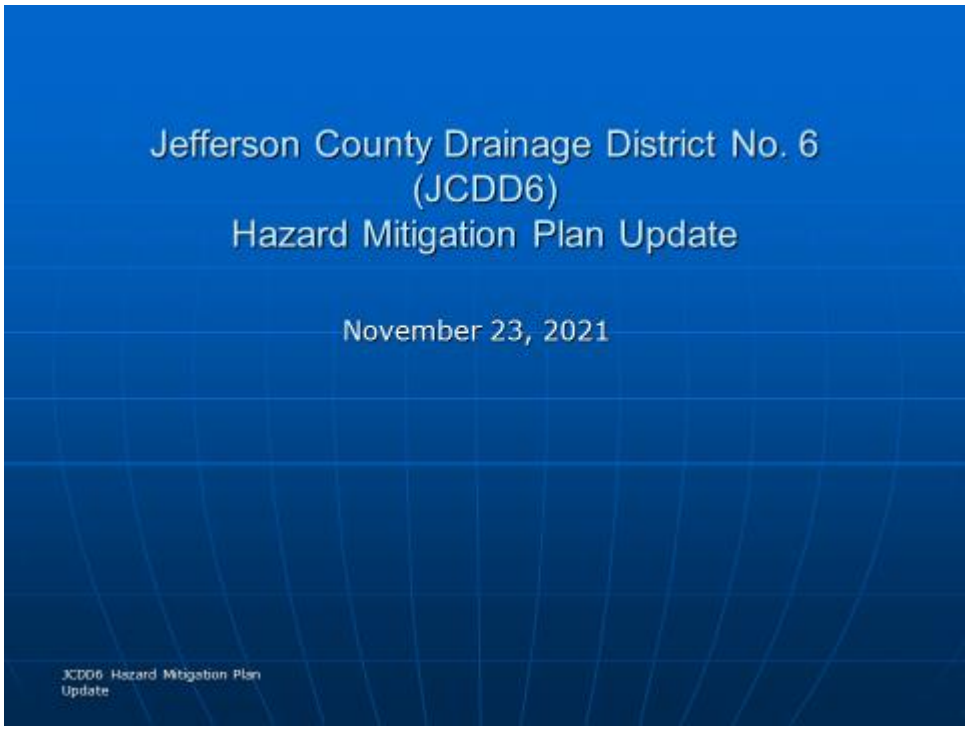
13. All bids must be plainly marked and should contain the following on the outside of the envelope:

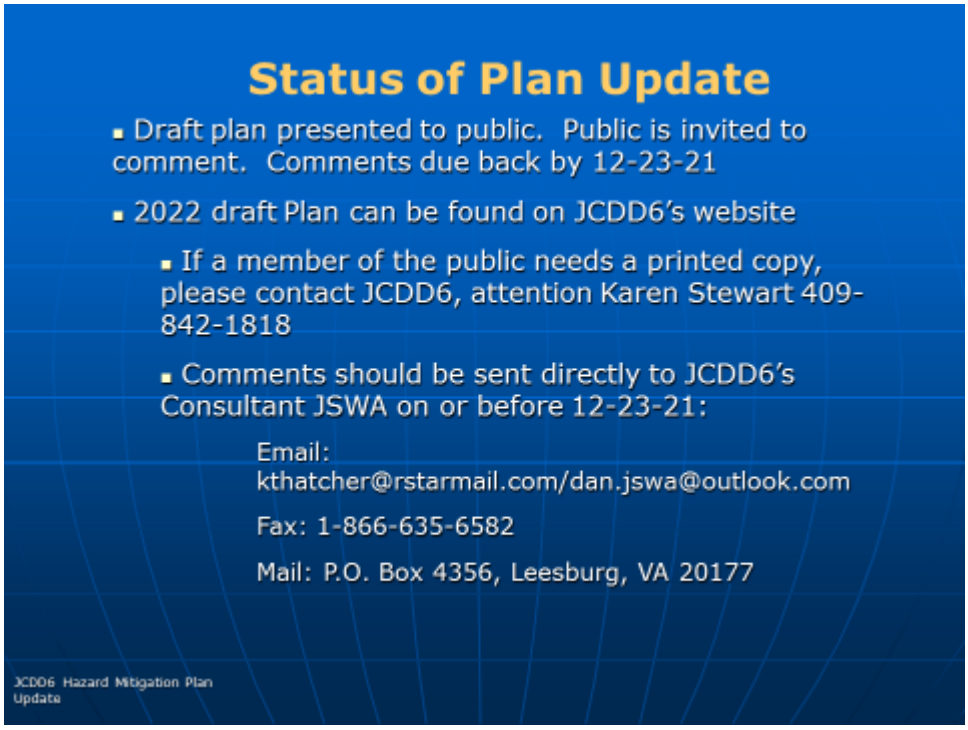
BID FOR "New Offices and Shop for Cameron Parish Drainage District #7
VSG Project No. 2135"

Robert Trahan, President
Drainage District #7

APPENDIX F

Presentation for Second Public Meeting 11-23-21





Next Steps After Public Comments

- Incorporate comments and changes into draft plan and submit to the Texas Division of Emergency Management – Submit by 12-27-21
- Incorporate TDEM Comments
- Re-submit to TDEM for FEMA review
- Incorporate FEMA comments
- FEMA approved pending adoption (APA)
- JCDD6 Board of Directors adopts the plan update

JCDD6 Hazard Mitigation Plan Update

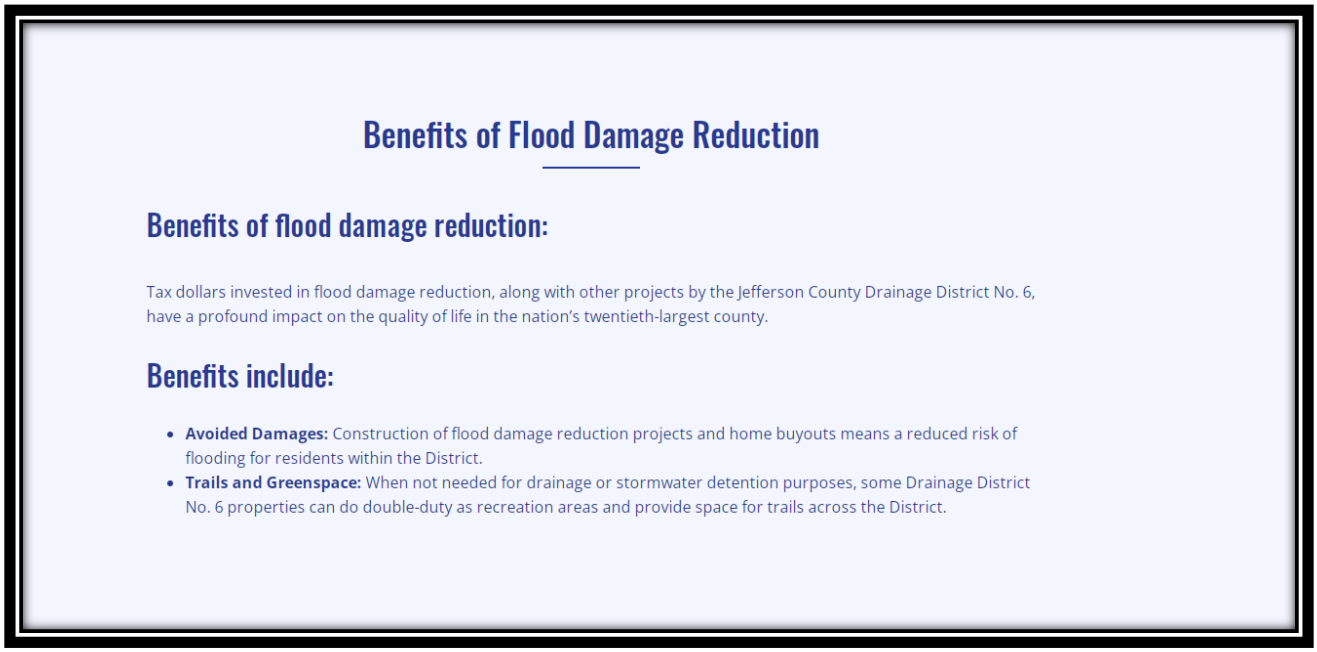
Questions and Comments

Point of Contact

Kristen Thatcher
JSWA
kthatcher@rstarmail.com

JCDD6 Hazard Mitigation Plan Update

APPENDIX G



Benefits of Flood Damage Reduction

Benefits of flood damage reduction:

Tax dollars invested in flood damage reduction, along with other projects by the Jefferson County Drainage District No. 6, have a profound impact on the quality of life in the nation's twentieth-largest county.

Benefits include:

- **Avoided Damages:** Construction of flood damage reduction projects and home buyouts means a reduced risk of flooding for residents within the District.
- **Trails and Greenspace:** When not needed for drainage or stormwater detention purposes, some Drainage District No. 6 properties can do double-duty as recreation areas and provide space for trails across the District.

APPENDIX H

JCDD6 Glossary of Terms (Found on Website)

Acre-Feet
Used to express volume of storage usually in a detention basin. One Acre-Foot is equal to one-acre times a one-foot depth or 43,560 cubic feet (325,850 gallons).

Alternatives
Combinations of one or more components that provide a complete plan to reduce flood damages. A number of alternatives may be formulated, and the preferred one is deemed the "recommended alternative."

Appraisal
A written estimate of the value of an asset or property prepared by a qualified, independent party.

Base Flood
A flood having a 1% chance of being equaled or exceeded in any given year. This flood is sometimes called the 1% or 100-year flood.

Base Flood Elevation (BFE)
This is the elevation above the average sea level that waters from a 1% (100-year) flood will reach at a given point along a creek or bayou. These elevations are determined using hydrology and hydraulic computer models. The elevations are then mapped on the topographic data for the county to produce the 1% (100-year) floodplain.

Benefit-To-Cost Ratio
Represents the overall efficiency of a plan. Determined by dividing the value of the annual benefit by the annual cost.

BMP
Best Management Practices

Bridge Modification
The replacement, extension or reinforcement of a bridge in order to remove an impediment to flow or accommodate a channel enlargement.

Buyout
The elimination of potential flood damages to houses or other types of structures by acquiring them and removing them.

Bypass Channel
The construction of a new channel in order to convey stormwater runoff around an area. Usually required due to right-of-way considerations or to avoid environmentally sensitive areas.

Capacity
The measure of water capable of flowing through a channel, measured in cubic feet per second (CFS). Also, the measure of how much water a stormwater detention facility holds, usually measured in acre-feet (AC-FT).

Capital Improvement Program
The District's CIP shows the schedule and projected funding for flood damage reduction projects for current and future years. The District's CIP is presented for a five-year time frame and adjusted annually.

Cellular Concrete Mats
A mat consisting of interlocking concrete "jigsaw puzzle-looking" blocks that is sometimes placed as a lining on the sides and bottom of a channel. These mats increase the efficiency of the flow of stormwater in the channel. Because the blocks have openings through them, grass and other vegetation can grow through them minimizing the occurrence of erosion in an aesthetically pleasing manner.

Channel
A course or passage through which stormwater may move or be directed. It is a generic term used by the District in reference to ditches, bayous, creeks or other smaller tributaries. A channel can vary in shape and size, and can be either natural or man-made.

Channel Flow
The amount of stormwater flowing through a channel, often measured in cubic feet (of stormwater) per second (or CFS).

Channel Modification
A man-made change to a channel's characteristics, typically for the purposes of reducing flood damages by increasing its overall conveyance. This can be accomplished by widening and/or deepening the channel, reducing the friction by removing woody vegetation or by lining the channel with various materials.

CLOMR
A Conditional Letter of Map Revision (CLOMR) is FEMA's comment on a proposed project that would affect the hydrologic and/or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway or effective Base Flood Elevations. There is no appeal period. The letter becomes effective on the date sent. This letter does not revise an effective National Flood Insurance Program map, it indicates whether a proposed project would produce a change in a Special Flood Hazard Area by FEMA if later submitted as a request for a Letter of Map Revision.

Closing
The final phase of a transaction, especially the meeting at which procedures are carried out in the execution of a contract for the sale of real estate.

Closing Costs
Fees a home buyer or seller pays at closing, such as property insurance, taxes, attorneys' fees, an origination fee, an amount placed in escrow, title insurance, mortgage insurance premium, points and filing fees associated with the sale of property.

Compartment
A section of a detention basin designed so that the excavation can be constructed separately, and potentially operated separately, from other sections of the same detention basin.

Components
Specific applications of flood damage reduction "tools," such as a detention basin or channel enlargement, at a particular location.

Condemnation
The legal process for the taking of private property.

Confluence
The intersection of two or more streams, or where one flows into another.

Conveyance
The ability of a channel or other drainage element to move stormwater.

Corps
U.S. Army Corps of Engineers, also USACE. The federal agency authorized to partner with local governments (such as the District) to conduct major water resources projects. The Corps operates nationally and evaluates funding requirement for all projects. The Corps also supports U.S. military operations. For more info on this region's Corps, go to the U.S. Army Corps of Engineers, Galveston District's website at www.swg.usace.army.mil. For more general info on the Corps, go to www.usace.army.mil/.

D/S
Downstream

Deed
A legal document that evidences a person's ownership of and right to possess a property.

Desired Capacity
A measure of what area communities, in conjunction with the Jefferson County Drainage District No. 6, determine is needed for a project to provide an acceptable level of flood damage reduction. This desired capacity is based on factors such as the extent of flooding, available land and available funding, sometimes through partnerships. See Capacity.

Detention Basin
An area of land, usually adjacent to a channel, that is designed to receive and hold above-normal stormwater volumes. Most stormwater detention basins in Jefferson County are excavated. The

detained stormwater then slowly drains over time out of the detention basin as the flow in the channel and associated water surface elevations recede. (also, Stormwater Detention)

Disaster Area
When a disaster is beyond the capabilities of state and local government to respond, the Governor must make a formal request to the President to declare the affected region a "disaster area." When the presidential declaration is enacted, federal assistance is made available to public and certain non-profit entities, as well as to individuals who were adversely affected by the disaster. The assistance is available in many forms, including monetary, temporary housing, crisis counseling and even legal assistance. For more on the Disaster Declaration process, go to: www.fema.gov/rebuild/recover/dec_guide.shtm.

Discrete Segment
Unique term developed to describe the logical pieces of large, long-range projects for determining Federal reimbursement to the local sponsor. Once a discrete segment of a project (e.g., defined element of channel or stormwater detention construction) is complete and functional, it qualifies for reimbursement.

Duplication Of Benefits
A situation in which benefits are derived from two federal government-sponsored programs for the same item. An example would be a homeowner collecting flood insurance to cover damage to the home, and then being paid full pre-flood value for the home without deducting the insurance proceeds. The District policy and FEMA regulations prohibit duplication of benefits in a home buyout.

Easement
A limited interest in real property for a specific purpose, usually designated in the granting instrument or plat. Another entity or individual has fee title to the property.

Element
A major subdivision of an overall flood damage reduction plan divided based on scheduling, financial or geographic criteria.

Elevation
The vertical distance measured from a datum to a specific point of interest.

Elevation Certificate
An Elevation Certificate is a detailed survey of a structure's elevation to see if it is above or below the base flood elevation. An Elevation Certificate can be used to reduce the cost of flood insurance or even remove a particular structure from the 1% (100-year) floodplain.

Encroachment
Construction, such as a wall, fence, building, etc., on the property of another.

EPA
Environmental Protection Agency

Escrow
An account established by a lender in which a homebuyer's funds are deposited for the payment of items such as property taxes and homeowner's insurance.

Existing Capacity
The measure of how much water a channel can currently carry, measured in cubic feet (of stormwater) per second (CFS). Also, the measure of how much water a stormwater detention facility can currently hold, usually measured in acre-feet (AC-FT) of volume.

Fair Market Value
"The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus..." The value for District transactions is determined by an appraiser, licensed or certified by the State of Texas.

Fee Simple
Full ownership of real property by an individual or entity.

FEMA
(Federal Emergency Management Agency) - The federal agency responsible for providing leadership and support to reduce loss of life and property and to protect our institutions from all types of hazards. This is accomplished through a comprehensive, risk based, all hazards emergency management program consisting of mitigation, preparedness, response, and recovery. In relation to flooding hazards, FEMA is the federal agency responsible for administering the National Flood Insurance Program (NFIP).

FIRM Panel
FIRM stands for Flood Insurance Rate Map. In order to print the FEMA Flood Insurance Rate Maps at a scale of 1-inch = 1,000-feet, the maps are broken out into over 150 FIRM panels that cover the entire Harris County area.

Flap Gate
A flap gate is a simple mechanical device used to control the direction of flow of stormwater and is typically used at the end of a pipe draining into a channel. The flap gate allows water to drain from the pipe into the channel but closes when stormwater in the channel begins to rise higher than the water being delivered by the pipe.

Flood Bench
Typically, a design feature obtained by enlarging a channel's cross-sectional geometry so that it varies in width and steepness, creating flatter slopes and even plateaus, giving completed segments more of a natural appearance.

Flood Insurance Rate Maps
Prepared by FEMA, Flood Insurance Rate Maps, or FIRMs, show areas that have the highest probability of flooding and illustrate the extent of flood hazards in a flood-prone community.

These maps are used to determine flood insurance rates for communities participating in the National Flood Insurance Program (NFIP).

Properties located in mapped zones AE, AO, A, or VE are required to have flood insurance if the owner has a federally backed mortgage on the property.

Flood Insurance Study
A study FEMA initiates to undertake a new hydraulic and/or hydrologic analysis for streams within a community. Often, these studies incorporate the new information into the FEMA Flood Insurance Rate Maps (FIRMs).

Floodplain
From time to time, bayous and creeks naturally come out of their banks due to heavy rainfall and inundate the adjacent land. This area that is inundated is referred to as a floodplain. Residences and businesses within the floodplain are considered to be at risk of being damaged by flooding. The floodplain is typically expressed by stating its frequency of occurrence. For example, the 1% (100-year) floodplain represents an area of inundation having a 1% chance of being equaled or exceeded in any given year, whereas the 2% (50-year) flood plain has a 2% chance of being equaled or exceeded in any given year. FEMA Flood Insurance Rate Maps (FIRMs) show the 1% (100-year) and 0.2% (500-year) floodplains.

Floodway
For most waterways, the floodway is where the water is likely to be deepest and fastest. It is the area of the floodplain that should be reserved (kept free of obstructions) to allow floodwaters to move downstream. Technically, the floodway is typically calculated by finding the area that must be reserved to carry and discharge the 1% (100-year) flood without increasing the base flood by more than 1-foot.

Flowline
A line formed representing the lowest point in the bottom of and along a specified length of a channel.

Fluvial Geomorphology
The study of river behavior and river-related landforms, such as riverbeds, floodplains and stream forms.

FY
Fiscal year

Gabion
Rock-filled wire baskets either laid as mattresses or stacked in a manner that forms a retaining wall. Gabions are sometimes used to support the banks and sides of channels for structural reasons, as well as minimize the occurrence of erosion.

GIS
(Geographic Information System) - A computer program or programs used to store a wide variety of types of information and link that information to a specific geographic location. Some examples of this information the District utilizes would be streets, bayous and channels, HCAD parcel data, contours, floodplains and all the data that supports this information such as names, location and much more.

GPS
(Global Positioning System) - GPS is a system that uses satellites to accurately determine the location of any point on earth, and it helps to create the most accurate floodplain maps possible

GRR
General Re-evaluation Report. Submitted to USACE for approval of a revised plan for all or part of a project.

Hydraulics
The study of moving fluid. In the case of the District's work, hydraulics refers to analyzing the movement of stormwater flows in channels, pipes and detention basins to determine certain properties like stormwater depths and stormwater velocities.

Hydrology
The study of the rainfall-stormwater runoff process. Hydrological procedures are used to estimate the expected amount of stormwater entering a drainage system from a certain amount of rain falling over a certain watershed area.

Impacts
The expected change in stormwater characteristics (i.e., stormwater flow), velocities and depths caused by proposed changes in the watershed.

Infrastructure
The land, buildings and other assorted structures that serve public use. Infrastructure typically refers to the primary drainage system, including channels and detention basins (not streets, storm sewers, and roadside ditches).

Insufficient Capacity
Exists when the desired capacity of a channel or stormwater detention facility exceeds the existing capacity; that is, when a channel or a detention facility cannot carry or hold all of the stormwater that could flow to it.

K - No Terms

Levee
A physical barrier constructed to protect areas from rising floodwaters.

LiDAR
(Light Detection and Ranging) - LiDAR is a commercial technology that uses a laser mounted in an airplane to measure the elevation of the ground.

Lien
A legal claim allowed to a creditor against a debtor's property that must be paid when the property is sold in order to transfer.

LOMR
(Letter of Map Revision) - FEMA's modification to an effective Flood Insurance Rate Map (FIRM), or Flood Boundary and Floodway Map (FBFM), or both. LOMRs are generally based on the implementation of physical measures that affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective Base Flood Elevations (BFEs), or the Special Flood Hazard Area (SFHA). The LOMR officially revises the Flood Insurance Rate Map (FIRM) or Flood Boundary and Floodway Map (FBFM), and sometimes the Flood Insurance Study (FIS) report, and when appropriate, includes a description of the modifications. The LOMR is generally accompanied by an annotated copy of the affected portions of the FIRM, FBFM, or FIS report. An Appeal/Protest period exists only when there is a change in the BFE.

Mitigation
To offset the impact of one action by implementing another. Examples of various forms of mitigation, as used by the Jefferson County Drainage District No. 6, include:

1. Offsetting the impacts from land development projects. This is usually in the form of a stormwater detention basin. The development area will drain into the stormwater detention basin, and ultimately, into a channel.
2. Offsetting the impacts of wetlands/habitat losses. State and Federal laws protect certain wetlands and habitat. Through a permit process, agencies require projects to "avoid, minimize and mitigate" any unavoidable losses. Mitigation is typically done through recreation of the affected wetlands or habitat areas. Certain wetlands losses can be mitigated with the District's wetlands mitigation banking.

An individual homeowner can also mitigate financial losses caused by flood damage by purchasing a flood insurance policy.

Mortgage
A legal document that pledges a property to a lender as security for the payment of a loan or debt.

Moving Costs
Expenditures associated with moving, including packing and unpacking, temporary storage of personal property, transportation, moving insurance, disconnecting and reconnecting household appliances and other related items.

Moving Expenses
The direct costs associated with moving the personal property of qualified homeowners from a flooded home that was purchased by the District. (Note that this does not apply for the voluntary buyout program.)

MS4
Municipal Separate Storm Sewer Permit

Multi-Use
The ability to provide more than one use. This usually is in reference to drainage facilities or detention basins that not only provide for flood damage reduction, but can also accommodate other uses, such as hike-and-bike trails, sports fields, wildlife habitat, etc.

NFIP
(National Flood Insurance Program) - Created by Congress in 1968 to provide low-cost flood insurance for property owners in flood-prone communities. In exchange for flood insurance eligibility, communities agree to implement and enforce floodplain management measures to reduce the possibilities of future damage. FEMA arranges for periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements. FEMA works with local officials to evaluate the FIRMs and associated Flood Insurance Study and conducts updates as needs and priorities dictate.

NOAA
National Oceanic and Atmospheric Administration
Non-Point Sources
Indirect sources of stormwater runoff - such as roadways, yards or agricultural areas - that can be the origins of stormwater pollution in the overall drainage infrastructure.

NPDES
(National Pollutant Discharge Elimination System) - As authorized in 1990 by the Clean Water Act, NPDES is a federally mandated permit program intended to control water pollution by regulating point sources that discharge pollutants into waters of the United States. Under the storm water component of the permit program, the federal government requires municipal separate storm sewer systems (MS4s) serving a population of 100,000 or more to have a stormwater NPDES permit.

O&M
Operation and Maintenance

Other Frequency Floods
There are an infinite number of frequency floods that can occur. The 1% (100-year) flood is used by many as a standard for regulations, designs and National Flood Insurance Program purposes. Other floods often used consist of the 0.2% (500-year) flood, the 2% (50-year) flood, the 10% (10- year) flood and the 50% (2-year) flood.

Outfall
An outfall is simply the pipe, channel, or opening where water "falls out" and then into another body of water, typically a drainage channel. In a typical stormwater detention basin, the outfall is at or connected to the lowest point of the basin so that detained water drains completely.

Out-Of-Bank
The condition in which the water level of a channel rises above the top of its banks and spills into the surrounding land area.

Oxbow
Generally, a U-shaped bend or meander in a channel. Oxbows are sometimes "cut off" and abandoned when a channel is straightened. This can occur both naturally and by man-made means.

Pay-As-You-Go
Pay-As-You-Go refers to using current income (cash) instead of relying on debt (e.g., bonds) as a way to fund projects. Cash funding avoids long-term debt and its associated interest payments.

Peak Flow
(or Channel Peak Flow) - The maximum flow of stormwater flowing through a channel at a given location, based on a certain amount of rainfall falling in that area.

Physical Condition
A detailed listing of all of the physical aspects of a channel that can influence its effectiveness. Physical condition includes the bottom and sides of a channel, as well as the condition of structures, such as bridges.

Point Sources
Specific conveyances, such as pipes or man-made ditches that flow into, or are part of the overall drainage infrastructure.

Ponding
The process, occurring after a rainfall, when water gathers in low lying areas throughout a watershed. Frequently referring to water standing in the streets when the capacity of the storm sewer is exceeded.

Project Process
Project Process includes the Feasibility Stage, Development Stage, Property Acquisition and Utility Relocation Stage, Design Stage and Construction Stage. A funding allotment must be secured for each stage of the project process.

Q - No Terms

Repetitive Loss Property

Homes that have received more than $1,000 of flood insured damage two or more times in the last ten years will appear on the National Flood Insurance Program (NFIP) repetitive loss database and receive higher priority for certain types of buyouts.

Residences
Any dwellings in which people live, including single-family houses, apartment units, mobile homes and travel trailers • Right of Way (also right-of-way, ROW) An interest in real property, either in fee or easement.

Right-Of-Way
Land used by a public agency for public purposes, such as building roads or improving channels.

Riparian
(Corridor or Zone) - The area of land along and adjacent to a waterway (river, bayou, creek, stream, etc.). Trees, plants and grasses along these waterways are called riparian vegetation. A riparian zone from an ecological perspective may occur in many forms including grassland, woodland, wetland or even non-vegetative. Riparian zones may be natural or engineered for soil stabilization or restoration. In some regions the terms riparian woodland, riparian forest, riparian buffer, or riparian corridor are used to characterize a riparian zone.

Riprap
Rocks or broken pieces of concrete often placed in areas where the flow of stormwater is expected to cause erosion. The riprap serves as "armor" for areas of channels and detention basins to minimize the occurrence of erosion.

Riverine Flooding
Flooding that is the result of creeks and bayous leaving their banks as a result of a heavy rainfall. This type of flooding is mapped on the Flood Insurance Rate Maps.

Runoff
The stormwater from rainfall not absorbed by the ground that flows into the local drainage system, and ultimately, streams and bayous.

SFHA
(Special Flood Hazard Area) - An area defined on a FEMA Flood Insurance Rate Map with an associated risk of flooding.

Sheet Flow
(Overland Flow Flooding) - Flooding that occurs when intense local rainfall flows overland to reach a channel. Frequently, this condition exists when runoff exceeds storm sewer or roadside ditch capacity, and the water can "pond" in the streets deep enough to flood residences that are not even near a creek of bayou. The water will seek a path to the channel by flowing overland (Sheet Flow). When residences and other structures are in that path, flooding occurs, and this type of flooding is not identified on the Flood Insurance Rate Maps.

Stormwater Detention Basins

An area of land, usually adjacent to a channel, which is designed to receive and hold above-normal stormwater volumes. Most stormwater detention basins in Jefferson County are excavated. The detained stormwater then slowly drains, over time, out of the detention basin as the flow in the channel and associated water surface elevations recede.

Substantially Damaged Property
Flood damage to a structure where the cost to repair equals or exceeds 50% of the value of the structure, excluding the land value.

Sub watershed
(also, Tributary watershed) - The land area that drains to one of the smaller streams that flow to the main channel of a watershed.

SWMP
Stormwater Management Program

SWPPP
Storm Water Pollution Prevention Plan

Topographic Data
Detailed information about the shape of the earth including ground elevations and ground contours.

TPDES
The state program for issuing, amending, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under the Clean Water Act §§ 307, 402, 318 and 405, Texas Water Code, and Texas Administrative Code regulations.

TPWD
Texas Parks and Wildlife Department

Tributary
A channel through which water may move or be directed that ultimately flows into a larger channel, usually bayous and creeks.

Tributary Watershed
(also Sub watershed) - The land area that drains to one of the smaller streams that flow to the main channel of a watershed.

TxDOT
Texas Department of Transportation

U/S
Upstream
Unincorporated Jefferson County

The area in Jefferson County, Texas, which is not within an incorporated area of a city, town, or village.

USACE
(United States Army Corps of Engineers) - The federal agency authorized to partner with local governments (such as the District) to conduct major water resources projects. The Corps operates nationally and evaluates funding requirements for all projects. The Corps also supports U.S. military operations.

V - No Terms

Wastewater Treatment Facility
An arrangement of devices and structures, excluding septic tanks, constructed and installed for the purpose of treatment of wastewater from domestic, commercial or industrial sources or combinations thereof, and which discharge its treated effluent into any surface water.

Water Surface Elevation
The distance the water surface in a creek or bayou is above mean sea level, measured at a given location along a creek or bayou.

Water Surface Elevation Profile
Shows the elevation above mean sea level of the 1% (100-year) or 0.2% (500-year) floodplain along all the studied stream miles in a particular watershed.

Watershed
A geographical region of land or "drainage area" that drains to a common channel or outlet, mostly creeks and bayous in Jefferson County. Drainage of the land can occur directly into a bayou or creek or through a series of systems that may include storm sewers, roadside ditches, and/or tributary channels.

Weir
A structure typically constructed to control the timing and amount of stormwater flowing into an adjacent detention basin. As the stormwater level in the channel increases, water flows into the basin over the weir. The lower a weir, the sooner the rising stormwater enters the basin. The longer a weir, the greater the flow of stormwater entering the basin.

X - Z - No Terms

APPENDIX I

USACE Public Statements on Sam Rayburn and Tom Bluff Dams

Sam Rayburn Dam

Project Description

The United States Army Corps of Engineers (USACE) completed construction of Sam Rayburn Dam in 1966 with the project purpose to provide flood risk management, water supply, environmental regulation, recreation, and hydropower. Sam Rayburn Dam is located on the Angelina River about 10 miles northwest of the city of Jasper, Texas. Sam Rayburn Dam and Reservoir operates in conjunction with Town Bluff Dam (National Inventory of Dams TX00015) and B.A. Steinhagen Lake to provide flood control to the Angelina and Neches River Basin System. Since both projects went into operation, they have reduced damage caused by downstream flooding by more than an estimated $2.3 Billion (adjusted to 2020 dollars). Sam Rayburn Dam is primarily an earthen embankment dam with a concrete outlet works and an uncontrolled labyrinth weir spillway, which holds water to 14-feet below the top of the dam to regulate the reservoir when pool elevation exceeds capacity. It also includes a hydropower facility which produces up to 52MWs of power supply for the Southwestern Power Administration. During large storm events, the dam temporarily stores flood waters to manage flooding downstream. After the storm passes and the Neches River Basin recedes, water can be safety released downstream in accordance with the approved water control plan. Water storage and flood releases are managed by the hydroelectric powerhouse and two water control gates operated by onsite USACE personnel.

Risk Characterization

Although Sam Rayburn Dam reduces the risk of flooding to downstream communities, the dam **does not eliminate the risk of flooding**. The most likely scenario that could result in downstream flooding are high volume releases from Sam Rayburn Dam through the outlet works and uncontrolled spillway during high water events. These surcharge operational releases occur when the reservoir's flood storage capacity is exceeded and excess water flows through the spillway. Sam Rayburn Dam is designed to reduce the peak flooding levels downstream without risking the structural integrity of the dam. USACE completed a risk assessment in November 2016 and classified the risk associated with Sam Rayburn Dam as moderate. This risk classification is primarily driven by the very low probability for dam failure and the number of large populations at risk below Sam Rayburn Dam. The potential for breach of Sam Rayburn Dam was assessed to be related to three primary risks associated with earthen embankment dams: 1) During an extreme flood event, erosion may occur at the left abutment leading to eventual breach of the dam, 2) Erosion may occur through the foundation near the old river channel leading to eventual breach of the dam, and 3) Erosion along the interface of the powerhouse facility and main embankment during high reservoir elevations could lead to eventual breach of the dam. In the remote event of a dam breach the largest impacts would be to the cities of Evadale, Beaumont, and Nederland, Texas. Potentially impacted infrastructure includes road networks, electrical substations, communication facilities, water treatment facilities, police and fire stations, hospitals, airports, and schools. Levees in the downstream populated areas would experience overtopping and would not contain the floodwaters. Although the downstream communities have well-practiced emergency action plans; local emergency managers are aware of the unlikely potential for dam failure; and local emergency managers meet regularly with USACE to discuss emergency response to flood events, breach of the dam from either risk category could result in catastrophic flooding downstream and include widespread economic impacts and significant loss of life.

Risk Reduction Measures (Narrative)

USACE is continually taking proactive steps to reduce risk and ensure public safety. This includes conducting emergency exercises with local and state emergency responders to enhance evacuation planning; annual updates to the Emergency Action Plan to improve emergency response actions; and development of a detailed communications plan for the dam. USACE will continue to identify and implement interim risk reduction measures such as stockpiling materials to mitigate the potential for erosion of the embankment or foundation. Additionally, the dam is well maintained and USACE conducts detailed inspections of the dam during both normal lake levels and increased surveillance during flood events to ensure the integrity of the structure. Lastly, the dam has a robust instrumentation and monitoring system to allow USACE staff to evaluate the dam for changing conditions and there are pre-positioned materials at the project site to perform immediate flood fighting activities as necessary.

Town Bluff Dam

Project Description

The United States Army Corps of Engineers (USACE) completed construction of Town Bluff Dam in 1951 with the project purpose of re-regulating water releases from Sam Rayburn Dam (upstream), water supply, environmental regulation, recreation, and hydropower. Town Bluff Dam is located on the Neches River about 10 miles southwest of the city of Jasper, Texas. Town Bluff Dam operates in conjunction with Sam Rayburn Dam (National Inventory of Dams TX00011) to provide flood control along the Angelina and Neches River Basin Systems. Since both projects went into operation, they have reduced damage caused by downstream flooding by more than an estimated $2.3 Billion (adjusted to 2020 dollars). The project is comprised primarily of a concrete lined earthen embankment (which also serves as an uncontrolled spillway), a gated outlet works with six tainter gates, and a hydropower plant which produces up to 6MWs of power supply for the Southwestern Power Administration. During large storm events, the project operates as a run-of-the-river dam, increasing outflow to match inflow until reaching the top of spillway. When the reservoir elevation exceeds the top of spillway, project releases become uncontrolled until inflows reduce to levels manageable with the gated outlet works. Water control and flood releases are managed in accordance with the approved water control plan by the six tainter gates operated by onsite USACE personnel.

Risk Characterization

Although Town Bluff Dam reduces the risk of flooding to downstream communities, the dam **does not eliminate the risk of flooding**. The most likely scenario that could result in downstream flooding are high volume releases from Sam Rayburn Dam along the Angelina River and high volume inflows along the Neches River resulting in high flows from Town Bluff Dam. High flow, surcharge releases occur when the reservoir's inflow capacity exceeds the downstream channel capacity of 20,000 cfs. Town Bluff Dam is designed as a run-of-the-river dam, increasing outflow to match inflow without risking the structural integrity of the dam. USACE completed a risk assessment in July 2014 and classified the risk associated with Town Bluff Dam as low. This risk classification is primarily driven by the very low probability for dam failure and the number of large populations at risk below Town Bluff Dam. The potential for breach of Town Bluff Dam was assessed to be related to three primary risks associated with earthen embankment dams: 1) During an extreme flood event, erosion may occur through the foundation along old sloughs near the uncontrolled spillway, 2) Erosion may occur through foundation sands under the uncontrolled spillway, and 3) Erosion along the interface of the powerhouse embankment and original embankment could lead to eventual breach of the dam. In the remote event of a dam breach the largest impacts would be to the cities of Evadale, Beaumont, and Rose City, Texas. Potentially impacted infrastructure includes road networks, electrical substations, communication facilities, water treatment facilities, police and fire stations, hospitals, airports, and schools. Levees in the downstream populated areas would not experience overtopping and would contain the floodwaters. Although the downstream communities have well-practiced emergency action plans; local emergency managers are aware of the unlikely potential for dam failure; and local emergency managers meet regularly with USACE to discuss emergency response to flood events, breach of the dam from either risk category could result in catastrophic flooding downstream and include widespread economic impacts and loss of life.

Risk Reduction Measures (Narrative)

USACE is continually taking proactive steps to reduce risk and ensure public safety. This includes conducting emergency exercises with local and state emergency responders to enhance evacuation planning; annual updates to the Emergency Action Plan to improve emergency response actions; and development of a detailed communications plan for the dam. We will continue to identify and implement interim risk reduction measures such as stockpiling materials to mitigate the potential for erosion of the embankment or foundation. Additionally, the dam is well maintained and USACE conducts detailed inspections of the dam during both normal lake levels and increased surveillance during flood events to ensure the integrity of the structure. Lastly, the dam has a robust instrumentation and monitoring system to allow USACE staff to evaluate the dam for changing conditions and there are pre-positioned materials located at the project site to perform immediate flood fighting activities as necessary.