City of Alvin, Texas

Paul Horn, Mayor

Joel Castro, Mayor Pro-tem, At Large Pos. 2
Brad Richards, At Large Pos. 1
Martin Vela, District A
Adam Arendell, District B

Keith Thompson, District C
Glenn Starkey, District D
Gabe Adame, District E

ALVIN CITY COUNCIL AGENDA
THURSDAY, JANUARY 7, 2021
7:00 P.M.
(Council Chambers)

Alvin City Hall, 216 West Sealy, Alvin, Texas 77511

Persons with disabilities who plan to attend this meeting that will require special services please contact the City Secretary's Office at 281-388-4255 or droberts@cityofalvin.com 48 hours prior to the meeting time. City Hall is wheel chair accessible and a sloped curb entry is available at the east, west, and south entrances to City Hall.

NOTICE is hereby given of a Regular Meeting of the City Council of the City of Alvin, Texas, to be held on **THURSDAY, JANUARY 7, 2021**, at 7:00 p.m. in the Council Chambers at: City Hall, 216 W. Sealy, Alvin, Texas.

REGULAR MEETING AGENDA

1. CALL TO ORDER

2. INVOCATION AND PLEDGE OF ALLEGIANCE

3. PUBLIC COMMENT

4. CONSENT AGENDA: CONSIDERATION AND POSSIBLE ACTION: An item(s) may be removed from the Consent Agenda for full discussion by the request of a member of Council. Item(s) removed will automatically become the first item up for discussion under Other Business.

A. Consider approval of the December 17, 2020 City Council Regular meeting minutes.

B. Accept resignation from Planning Commission member Jake Starkey.

C. Consider a bid award to Napco Chemical Company, as the City's vendor for Sodium Bisulfite for one (1) year with an option to continue for an additional one (1) year at the same price and conditions, for an estimated total of $25,000 per year.

D. Consider a bid award to DXI Industries, Inc. as the City's vendor for Sodium Hypochlorite for one (1) year with an option to continue for an additional one (1) year at the same price and conditions, for an estimated total of $50,000 per year.

5. OTHER BUSINESS

A. Consider the purchase of an Elgin Crosswind 1 Street Sweeper from Kinloch Equipment and Supply, Inc., through the BuyBoard Cooperative Purchasing Program in an amount not to $232,431.25.

B. Consider Resolution 21-R-03, approving the Development Agreement between the City of Alvin, Texas, the Brazoria-Fort Bend Counties Municipal Utility District No. 3, D.R. Horton-Texas, Ltd., and 258 Colony Investments, Ltd.; and authorize the Mayor to sign the Agreement upon legal review.

C. Consider an Engineering Services Agreement with Freese and Nichols, Inc. in an amount not to exceed $380,000 for engineering design services for the Wastewater Master Plan,

Sanitary Sewer Evaluation Study, and Water and Wastewater Rate Study; and authorize the City Manager to sign the Agreement upon legal review.

D. Consider an Engineering Services Agreement with Freese and Nichols, Inc. in an amount not to exceed $59,914 for engineering design services for the Alvin Wastewater Treatment Plant Facility Plan; and authorize the City Manager to sign the Agreement upon legal review.

E. Consider Resolution 21-R-01, adopting The City of Alvin 2020 Hazard Mitigation Plan Update; and authorize the Mayor to sign the Plan.

6. REPORTS FROM CITY MANAGER

A. Items of Community Interest and review preliminary list of items for next Council meeting.

7. ITEMS OF COMMUNITY INTEREST

Pursuant to 551.0415 of the Texas Government Code reports or an announcement about items of community interest during a meeting of the governing body. No action will be taken or discussed.

A. Hear announcements concerning items of community interest from the Mayor, Council members, and City staff, for which no action will be discussed or taken.

8. ADJOURNMENT

I hereby certify that a copy of this notice was posted on the City Hall bulletin board, a place convenient and readily accessible to the general public at all times, and to the City's website: www.alvin-tx.gov, in compliance with Chapter 551, Texas Government Code, on MONDAY, JANUARY 4, 2021 at 4:00 P.M.

(SEAL)

_____
Dixie Roberts, City Secretary

Removal Date: _____

**** All meetings of the City Council are open to the public, except when there is a necessity to meet in Executive Session (closed to the public) under the provisions of Chapter 551, Texas Government Code. The Council reserves the right to convene into executive session on any of the above posted agenda items that qualify for an executive session by publicly announcing the applicable section of the Open Meetings Act, including but not limited to sections 551.071 (litigation and certain consultation with the attorney), 551.072 (acquisition of interest in real property), 551.073 (contract for gift to city), 551.074 (certain personnel deliberations), or 551.087 (qualifying economic development negotiations).**

MINUTES
CITY OF ALVIN, TEXAS
216 W. SEALY STREET
REGULAR CITY COUNCIL MEETING
THURSDAY DECEMBER 17, 2020
7:00 P.M.

CALL TO ORDER

BE IT REMEMBERED that, on the above date, the City Council of the City of Alvin, Texas, met in regular session at 7:00 P.M. in the Council Chambers at City Hall, with the following members present: Mayor Pro-Tem Joel Castro; Councilmembers: Brad Richards, Glenn Starkey, Keith Thompson and Martin Vela**.**

Staff members present: Junru Roland, City Manager; Suzanne Hanneman, City Attorney; Dixie Roberts, City Secretary; Michelle Segovia, City Engineer; Larry Buehler, Economic Development Director; Athlyn Allen, Convention and Visitors Bureau Coordinator and Robert E. Lee, Police Chief.

INVOCATION AND PLEDGE OF ALLEGIANCE

Elder Richardson of the Jesus Christ of Latter Day Saints gave the invocation.

The Royal Rangers led the Pledge of Allegiance to the American Flag and the Pledge to the Texas Flag.

PRESENTATION

Proclamation - Keep Alvin Beautiful Governor's Community Achievement Award.

Mayor Pro-tem Castro presented a proclamation to members of the Keep Alvin Beautiful for receiving the 2020 Governor's Community Award.

PUBLIC COMMENT

There were no comments from the public.

CONSENT AGENDA

Consider approval of the December 3, 2020 City Council Regular meeting minutes.

Consider an award of bid to Greenscapes Six, LLC., for the 2021-2022 Concrete Repair Program, in an amount not to exceed $225,000 for a term of one (1) year with an option to renew for one (1) year with the same terms and conditions; and authorize the City Manager to sign the contract subject to legal review.

On November 10, 2020, bids were opened for the 2021-2022 Concrete Repair Program, and Greenscapes Six, LLC was the qualified bidder. This Contractor has worked on previous City of Alvin projects and Staff were pleased with the work completed. Total Contract Amount Including Alternate Bid Items: $225,000

The 2021-2022 Concrete Repair Program utilizes the Contractor to perform point repairs on concrete streets, sidewalks, curbs, storm inlets, and ADA ramps at locations throughout the City as directed by the City's Public Services Department. The City has bid Concrete Repair Program projects similar to this one for the last nine years. Staff recommends approval.

Council member Thompson moved to approve the consent agenda as presented. Seconded by Council member Vela; motion to approve carried on a vote of 5 Ayes.

OTHER BUSINESS

Receive and acknowledge the 2020 Charter Review Commission Report.

The Alvin City Charter is the governing document of the City of Alvin and was initially adopted in February 1963. The Charter is the City's constitution, and effectively creates the municipality and defines its functions. The Charter requires a review to occur at least every 4 years but no more often than every 2 years. The required review is to ensure the residents

and the governing body of the City that the Charter is adequately consistent with state and federal law, promotes good government practice by the City, creates better efficiency and effectiveness of City governance is at its best, and ensures clarification of charter terms to present day practice. The Charter Commission is tasked with reviewing the Charter and making recommendations to the City Council about the Commission's conclusions about these issues. The prior Commission served in 2016.

The 2020 Charter Review Commission was appointed by City Council June 18, 2020. The 7 Commission members are: Lindsey Vaughn, Chair, Beth Nelson, Vice-Chair, Nicole Kelinske, Secretary, and members Richard Garivey, Cary Perrin, Donna Starkey, and Heather Van Dine. As staff support, the City Attorney attended and assisted at all 11 meetings held by the Commission and throughout the entire process.

The Commission reviewed the Charter multiple times, received input from city staff and the City Attorney. The Commission prepared a report identifying its concerns and recommendations of changes to the Charter. Once the Commission submits its Report to Council, its duties are concluded although it may convene for the sole purpose of meeting with Council to discuss its report. Such a joint meeting will be scheduled in January 2021 for the purpose of discussing the Commission's recommendations with the Council. At that time, Council will vote to include, decline, or propose other changes to the Charter. Those proposed changes, if any, will be drafted by the City Attorney as an ordinance of the proposed amendments to the Charter for public vote at the May election. Council is required to call for a special election for any propositions of charter amendments, which must be done by February 19, 2021, pursuant to state election law. It is anticipated that Council would formally call for a special election, if needed, at the February 17, 2021 regular council meeting.

Suzanne Hanneman, City Attorney, presented to Council the 2020 Charter Review Commission's Report.

Council member Thompson moved to acknowledge receipt of the 2020 Charter Review Commission Report. Seconded by Council member Starkey; motion carried on a vote of 5 Ayes.

<u>Discuss and consider Resolution 20-R-35, establishing the Guidelines for Filming in Alvin, Texas; and setting forth other matters related thereto.</u>

Resolution 20-R-35 will establish the creation of Guidelines for Filming in Alvin, Texas, which outline the terms, criteria, and procedure to follow for obtaining the necessary permission, permits, and fees.

The State of Texas Film Commission and film friendly program connects media industry professionals with community liaisons across the state to provide local expertise and production support. Participation in this program provides Texas communities with a network for fostering media production in their municipalities and sends a clear message to media industry professionals that film friendly certified communities are serious about attracting their business.

The adoption of the Film Application Guidelines will allow us to work closely with the film friendly program to market Alvin to media production industries. If Alvin is selected for filming activity, this will help stimulate Alvin's economy by creating jobs for Texas-based crew members and residents as well as spurring on-site spending at local businesses. This type of economic development includes but is not limited to: lodging, catering, transportation, location fees, lumber, construction supplies, local hires and more.

The Department Heads have been able to review and add their input to the Guidelines for Filming in Alvin, Texas. The next steps after the approval of the Guidelines for Filming in Alvin, Texas, are to upload five filming locations to the film friendly website to finalize our certification into the program. Staff and our consultant met, compared several other city submittals, and are focusing on ten locations in the Alvin area that we felt were unique to Alvin, but also fit in with locations film productions are already looking for. Staff recommended approval of the Guidelines for Filming in Alvin, Texas.

Athlyn Allen, CVB Director presented this item before City Council with explanation.

Council member Starkey moved to approve Resolution 20-R-35, establishing the Guidelines for filming in Alvin, Texas and setting forth other provisions related thereto. Seconded by Council member Thompson; motion carried on a vote of 5 Ayes.

Discuss and consider Ordinance 20-EE, amending Chapter 28, Comprehensive Fee Ordinance of the Code of Ordinances, City of Alvin, Texas, for the purpose of establishing fees associated with the Guidelines for Filming in Alvin, Texas.

With the adoption of the Guidelines for Filming in Alvin, Texas, the City's fee ordinance has to be updated to reflect the fees associated with this activity. This fee ordinance will establish fees for filming City owned property or on City owned property, as well as for use of City equipment and personnel. These fees are suggested by the Texas Film Commission and are also based on the research of six (6) other film friendly cities' film application fees. Many of the cities follow the suggested rates, and a few cities change the application fee price depending on what works best for them. Staff recommends approval for amending the Chapter 28, Comprehensive Fee Ordinance.

Athlyn Allen, CVB Director presented this item before City Council with explanation.

Council member Thompson moved to approve Ord 20-EE, amending Chapter 28, Comprehensive Fee Ordinance of the Code of Ordinances, City of Alvin, Texas, for the purpose of establishing fees associated with the Guidelines for Filming in Alvin, Texas. Seconded by Council member Starkey motion carried on a vote of 5 Ayes.

Discuss and consider Resolution 20-R-32, for the re-appointment of Directors on the Kendall Lakes TIRZ Board and Authority Board for even numbered positions #2, #6, and #8, from December 31, 2020 to December 31, 2022; the appointment even number position #4 from December 31, 2020 to December 31, 2022, the appointment odd number position #5 from December 31, 2020 to December 20, 2021; and reappoint Ricky Kubeczka as the chairman.

The Kendall Lakes Tax Increment Reinvestment Zone (TIRZ) was created in 2005 to assist in the development of Kendall Lakes, a residential, commercial, and industrial area on the north side of the City of Alvin. There is a tax increment that is used for providing the needed infrastructure for the site through the ability of using bond proceeds. The TIRZ Authority and Board have the responsibility to develop policies that ensure good quality development for this site. TIRZ board members serve staggered even and odd year terms. Those positions up for re-appointment are Position #2 held by Armando Cespedes, Position #4 held by Vicki Ennis, Position #6 held by Scott Salter, and Position #8 held by Tom Stansel. Position #5 is vacant, and Cathy Fontenot is willing to fill the term ending December 31, 2021. Vicki Ennis is resigning from Position #4 and Sussie Sutton is willing to fill the term ending December 31, 2022. The Chair of both the Board and Authority is Ricky Kubeczka, and this position is reappointed each year. Staff recommends the current directors be reappointed in their respective terms that would expire December 31, 2022, appoint Sussie Sutton to Position #4, appoint Cathy Fontenot to Position #5, and to reappoint Ricky Kubeczka as the Chair of both the TIRZ and Authority Boards.

Larry Buehler, Economic Development Director, provided an explanation of the Kendall Lakes Tax Increment Reinvestment Zone (TIRZ) and Redevelopment Authority.

Council member Thompson moved to approve Resolution 20-R-32, re-appointing Position #2 held by Armando Cespedes, Position #6 held by Scott Salter, Position #8 held by Tom Stansel, appoint Sussie Sutton to Position #4 to the Kendall Lake TIRZ Board and Authority who's terms will expire December 31, 2022; apointing Cathy Fontenot to the vacant Position #5, who's term will expire December 31, 2021; and to reappoint Ricky Kubeczka as Chair of both the TIRZ and the Authority Board. Seconded by Council member Vela; motion carried on a vote of 5 Ayes.

Discuss and consider an award of bid to Harper Brothers Construction, LLC., for the 54 – Inch Eastside Interceptor Project in an amount not to exceed $16,044,021.84; and authorize the City Manager to sign the contract upon legal review.

On November 17, 2020, bids were opened for the 54-Inch Eastside Interceptor Project, and Harper Brothers Construction, LLC. was the qualified low bidder. Freese and Nichols, the City's consultant that designed the project, reviewed all bids that were received and has recommended Harper Brothers Construction, LLC. for this project.

Engineer's Project Estimate: $16,798,645

Contract Amount: $ 15,280,020.80 (Base Bid and Alternate Bid Items)

5% Contingency:	*$ 764,001.04*
Total Amount:	***$ 16,044,021.84***

This project consists of the installation of approximately 16,400 linear feet of 54-inch sanitary sewer trunk main line from Bypass 35 to the existing Wastewater Treatment Plant. This new line will replace the existing fifty plus year old 27-inch and 33-inch sanitary sewer trunk main lines and add needed capacity to the system. The alternate bid items will allow for consolidation of a lift station, include additional pavement replacement along the pipe alignment, and include additional sanitary sewer rehab adjacent to the new line. These improvements were based on recommendations in the 2015 Utility Master Plan by Freese and Nichols, Inc. that was approved by City Council on March 3, 2016. $16,399,450 of Water & Sewer Revenue bonds were previously issued by city council to fund this project -- $6,251,200 of the Series 2019 Revenue bonds, issued and approved on May 16, 2019; and $10,148,250 of the Series 2020 Revenue bonds, issued and approved on October 15, 2020. The project is scheduled to start in January 2021 and has a construction time of 540 calendar days.

Michelle Segovia, City Engineer, presented this item before City Council with explanation.

Council member Starkey moved to award a bid to Harper Brothers Construction, LLC., for the 54-Inch Eastside Interceptor Project in an amount not to exceed $16,044,021.84; and authorize the City Manager to sign the contract upon legal review. Seconded by Council member Thompson; motion carried on a vote of 5 Ayes.

Discuss and consider an award of bid to Triple B Services, LLP., for the Moller Road Storm Sewer and Pavement Improvements Phase 1 Project in an amount not to exceed $1,292,298.60; and authorize the City Manager to sign the contract upon legal review.

On November 17, 2020, bids were opened for the Moller Road Storm Sewer and Pavement Improvements Phase 1 Project, and Triple B Services, LLP. was the qualified low bidder. Dannenbaum Engineering Corp., the City's consultant that designed the project, reviewed all bids that were received and has recommended Triple B Services, LLP for this project.

Project Budget:	$1,800,000.00
Contract Amount:	$1,230,760.57
5% Contingency:	$ 61,538.03
Total Amount:	**$1,292, 298.60**

This project is the first of a three-phase project to add a storm sewer system, concrete curb and gutter pavement, and sidewalk along Moller Road. This project is the third of several drainage improvement projects that were recommended in the M-1 Ditch Watershed Study that was completed in January 2011 by Dannenbaum Engineering. This project will be paid from the 2019 Certificates of Obligation that were approved by Council on June 6, 2019. The project is scheduled to start in January 2021 and has a construction time of 410 calendar days.

Michelle Segovia, City Engineer, presented this item before City Council with explanation.

Council member Thompson moved to award a bid to Triple B Services, LLP., for the Moller Road Storm Sewer and Pavement Improvements Phase 1 Project in an amount not to exceed $1,292,298.60; and authorize the City Manager to sign the contract upon legal review. Seconded by Council member Vela; motion carried on a vote of 5 Ayes.

Discuss and consider Ordinance 20-DD, amending the City of Alvin, Texas Ordinance 20-X, passed and approved on September 3, 2020, an ordinance approving and adopting the City of Alvin's budget for Fiscal Year 2020-2021 by approving a budget amendment to the original 2020-2021 budget; providing for a transfer of funds for the purpose of amending the budget and the organizational chart of the Engineering Department by funding an additional Building Inspector II position and

eliminating the CAD Technician II position as set forth in "Exhibit A;" providing for severability; and providing for other matters related thereto.

The Engineering Department is requesting a change to the Department's Organizational Chart by eliminating the recently vacated CAD Technician II position and adding a Building Inspector II position to service the City. With the shift in the operation of the Department, in recent years, from "in-house" project design to the use of hired consultants for project design, the City no longer has a need for a dedicated AutoCAD Technician to draft plans. The small amount of "in-house" design work that is done will be completed by the GIS Coordinator and the Assistant City Engineer.

The City currently has two Building Inspectors, and with the increase in development activity both now and in the future, there is a need for an additional building inspector. Since the CAD Technician II position and the Building Inspector II position are both in pay grade 11 this change would be a level transfer of funds within the current budget with no further appropriations needed. Approval of Ordinance 20-DD will amend the 2020-2021 budget by adding a Building Inspector II position and eliminating the CAD Technician II position from the Engineering Department Organizational Chart and will transfer the funds budgeted for the CAD Technician II position to the new Building Inspector position.

Michelle Segovia, City Engineer, presented this item before City Council with explanation.

Council member Vela moved to approve Ordinance 20-DD, amending the City of Alvin, Texas Ordinance 20-X, passed and approved September 3, 2020, an ordinance approving and adopting the City of Alvin's budget for Fiscal Year 2020-2021 by approving a budget amendment to the original 2020-2021 budget; providing for a transfer of funds for the purpose of amending the budget and the organizational chart of the Engineering Department by funding an additional Building Inspector II position as set forth in "Exhibit A;" providing for severability; and providing for other matters related thereto. Seconded by Council member Thompson motion carried on a vote of 5 Ayes.

REPORTS FROM CITY MANAGER

Items of Community Interest and review preliminary list of items for next Council meeting.

Mr. Junru Roland announced items of community interest

ITEMS OF COMMUNITY INTEREST

Hear announcements concerning items of community interest from the Mayor, Council members, and City staff, for which no action will be discussed or taken.

Council member Thompson announced that an Alvin Police Officer Goode was severely injured, and a Go Fund was set up to assist with his expenses. He wished everyone a Merry Christmas and a Happy New Year.

Council member Vela wished everyone a Merry Christmas and Happy New. He echoed the sentiments of Council member Thompson.

Council member Arendell was absent; therefore, he asked that Mayor Pro-Tem Castro would speak on his behalf. Council member Arendell requested that funding would be added to next year's budget to update the Christmas decorations along Gordon Street.

Council member Richards wished everyone a Merry Christmas and a Happy New Year. He thanked the city employees for the great job they do.

Council member Castro commented that the new Senior Center van is a good investment that is being used to transport Seniors throughout Alvin. He announced that former Mayor Joe Rossano had passed away. He encouraged everyone to support Officer Goode by donating to the Go Fund Me account. He wished everyone a Merry Christmas.

Council member Starkey spoke in support of assisting Officer Goode that was injured. He commended the Senior Center staff for maintaining a clean environment due to COVID. He reported

that the Senior Shuttle van is being put to good use and he will follow up to make sure that the reporting requirements are being met. He wished everyone a good holiday.

ADJOURNMENT

Mayor Horn adjourned the meeting at 7:37 p.m.

PASSED and APPROVED the 7th day of January 2021.

_____

Paul A. Horn, Mayor

ATTEST: _____

Dixie Roberts, City Secretary

Agenda Commentary

Meeting Date: 1/7/2021

Department: City Secretary **Contact:** Dixie Roberts, City Secretary

Agenda Item: Accept resignation from Planning Commission member, Jake Starkey.

Type of Item: ☐Ordinance ☐Resolution ☐Contract/Agreement ☐Public Hearing ☐Plat ☐Discussion & Direction ☒Other

Summary: Jake Starkey submitted his resignation from the Planning Commission for his term ending December 31, 2022. This agenda item is the formal acceptance of his resignation.

With the resignation of Mr. Starkey, there will be eight (8) members on the Commission. The Charter states that the Commission shall consist of not less than five (5) nor more than eleven (11) members.

Current members are Ashely Davis, Richard Garivey, Abrin Brooks, Santos Garza, Chris Hartman, Keko Moore, Carrie Parker, and Randall Reed.

Funding Expected: Revenue ☐ Expenditure ☐ N/A ☒ **Budgeted Item:** Yes ☐ No ☐ N/A ☒

Funding Account:_____ **Amount:** _____ **1295 Form Required?** Yes ☐ No ☒

Legal Review Required: N/A ☒ Required ☐ **Date Completed:**_____

Supporting documents attached:

- Jake Starkey's letter of resignation.

Recommendation: Move to accept the resignation from Planning Commission member, Jake Starkey.

Reviewed by Department Head, if applicable ☐
Reviewed by City Attorney, if applicable ☒
Reviewed by Chief Financial Officer, if applicable ☐
Reviewed by City Manager ☒

From: Jake Starkey <jake@battlecryrevival.com>
Sent: Thursday, December 10, 2020 2:27 PM
To: Shana Church <schurch@psf.cityofalvin.com>
Subject: Re: December Planning Commission

I think I might need to tender my resignation, it's been hectic starting the new coffee house and I don't really feel as if I have the time to devote to the Planning Commission.

Jake Starkey

Creative Director
Battle Cry Revival, LLC

Agenda Commentary

Meeting Date: 1/7/2021

Department: Public Services **Contact:** Brandon Moody, Director of Public Services

Agenda Item: Consider a bid award to Napco Chemical Company, as the City's vendor for Sodium Bisulfite for one (1) year with an option to continue for an additional one (1) year at the same price and conditions, for an estimated total of $25,000 per year.

Type of Item: ☐Ordinance ☐Resolution ☒Contract/Agreement ☐Public Hearing ☐Plat ☐Discussion & Direction ☐Other

Summary. Sodium Bisulfite is a chemical used at the Wastewater Treatment Plant after chlorine disinfection prior to discharging the effluent into the receiving water stream.

On December 1, 2020, bids were opened, and Napco Chemical Company was the lowest qualified bidder for Sodium Bisulfite at $1.46 per gallon.

The amount of wastewater being treated is contingent upon the amount of wastewater sent to the Wastewater Treatment Plant for treatment from the community. The projected annual cost for Sodium Bisulfite in FY21 at $1.46 per gallon is $25,000. Staff recommends the award of this bid.

Funding Expected: Revenue ☐ Expenditure ☐ N/A ☐ **Budgeted Item:** Yes ☒ No ☐ N/A ☐

Funding Account: 211-6003-00-2425 **Amount:** $25,000 **1295 Form Required?** Yes ☒ No ☐

Legal Review Required: N/A ☒ Required ☐ **Date Completed:** 12/30/2020 SLH

Supporting documents attached:

- Bid tabulation

Recommendation: Move to award bid to Napco Chemical Company as the City's vendor for the Sodium Bisulfite for one (1) year with an option to continue for an additional one (1) year at the same price and conditions for an estimated total of $25,000 per year.

Reviewed by Department Head, if applicable ☐
Reviewed by City Attorney, if applicable ☒
Reviewed by Chief Financial Officer, if applicable ☒
Reviewed by City Manager ☒

CITY OF ALVIN BID TABULATION
SODIUM BISULFITE
B-21-06

DATE OF BID OPENING	***BIDDER'S NAME***	*Napco Chemical Solutions*	*Commerical Chemical Products*	*Univar USA*	*Anomtech Services, LLC*
TUESDAY, DECEMBER 1, 2020		*2830 Spring Cypress*	*1707 Townhurst*	*8201 S. 212th St.*	*14090 Southwest Freeway, Ste 300*
2:15PM		*Spring, Texas 77388*	*Houston, Texas 77043*	*Kent, WA 98032*	*Sugarland, Texas 77478*
	QUOTED BY	*Jay Judge*	*Alan Falik*	*Rosie Holiday*	*Peter Anomneze*
	CONTACT	*Jay Judge*	*Alan Falik*	*Rosie Holiday*	*Peter Anomneze*
	TELEPHONE	*281-651-6800*	*713-463-1929*	*253-872-5000*	*713-304-0336*
	FAX	*281-651-6868*	*832-436-4708*	*253-872-5041*	*281-762-7295*
BID PRICE		*$1.46/ gallon*	*$1.49 / gallon*	*$1.70/gallon*	*$15.90/per gallon*
DELIVERY TIME		*48 hours*	*48 hours*	*2-3 days*	*48 hours*

Agenda Commentary

Meeting Date: 1/7/2021

Department: Public Services **Contact:** Brandon Moody, Director of Public Services

Agenda Item: Consider a bid award to DXI Industries, Inc. as the City's vendor for Sodium Hypochlorite for one (1) year with an option to continue for an additional one (1) year at the same price and conditions, for an estimated total of $50,000 per year.

Type of Item: ☐Ordinance ☐Resolution ☒Contract/Agreement ☐Public Hearing ☐Plat ☐Discussion & Direction ☐Other

Summary. Sodium Hypochlorite (liquid bleach) is a chemical used to disinfect the effluent (treated wastewater) from the City's Wastewater Treatment Plant.

On December 1, 2020, bids were opened and DXI Industries, Inc. was the lowest qualified bidder for Sodium Hypochlorite at $0.7784 per gallon. The projected annual cost for Sodium Hypochlorite at $0.7784 per gallon is $50,000.

Staff recommends approval of this bid award. Upon Council approval an award letter will be sent to vendor and City departments.

Funding Expected: Revenue ☐ Expenditure ☒ N/A ☐ **Budgeted Item:** Yes ☒ No ☐ N/A ☐

Funding Account: 211-6003-00-2425 **Amount:** $50,000 **1295 Form Required?** Yes ☐ No ☐

Legal Review Required: N/A ☒ Required ☐ **Date Completed:** 12/30/2020 SLH

Supporting documents attached:

- Bid tabulation

Recommendation: Move to award bid to DXI Industries, Inc. as the City's vendor for Sodium Hypochlorite for one (1) year with an option to continue for an additional one (1) year at the same price and conditions, for an estimated amount of $50,000 per year.

Reviewed by Department Head, if applicable ☐
Reviewed by City Attorney, if applicable ☒
Reviewed by Chief Financial Officer, if applicable ☒
Reviewed by City Manager ☒

CITY OF ALVIN BID TABULATION
SODIUM HYPOCHLORITE
B-21-08

DATE OF BID OPENING	**BIDDER'S NAME**	DXI Industries, Inc.	Brenntag Southwest, Inc.	Anomtech Services, LLC	Commerical Chemical Products
TUESDAY, DECEMBER 1, 2020 2:15PM		1919 Jacintoport Blvd.	1632 Haden Road	14090 Southwest Freeway, Ste 300	1707 Townhurst Drive
		Houston, Texas 77015	Houston, Texas 77015	Sugarland, Texas 77478	Houston, Texas 77043
	QUOTED BY	Janel Bakk	Gayle Tullier	Peter Anomneze	Alan Falik
	CONTACT	Janel Bakk	Gayle Tullier	Peter Anomneze	Alan Falik
	TELEPHONE	281-457-4848	713-330-8570	713-304-0336	800-858-7665
	FAX	281-457-4807	713-450-4699	281-762-7295	800-909-3962
BID PRICE		$.7784 / gallon	$.8475 / gallon	$ .85/ gallon	$.92 / gallon
DELIVERY TIME		2-3 days	2-4 days	48 hours	24-48 hours

Agenda Commentary

Meeting Date: 1/7/2021

Department: Public Services **Contact:** Brandon Moody, Director of Public Services

Agenda Item: Consider the purchase of an Elgin Crosswind 1 Street Sweeper from Kinloch Equipment and Supply, Inc., through the BuyBoard Cooperative Purchasing Program in an amount not to exceed $232,431.25.

Type of Item: ☐Ordinance ☐Resolution ☐Contract/Agreement ☐Public Hearing ☐Plat ☐Discussion & Direction ☒Other

Summary: Street sweeping provides cleaning of City streets to maintain a clean environment for residents and to remove debris, trash, and pollutants before they enter the storm drains that lead to local waterways.

Currently the City owns and operates a 2012 Tymco sweeper. This sweeper is utilized about 35+ hours a week, sweeping several miles of Alvin's main throughfares and neighborhood streets. Over the last few years, the Tymco sweeper has been taken out of service for maintenance and repairs several times, causing disruption in service for Alvin residents.

City Council approved funding in the FY21 budget to acquire a new street sweeper to replace the existing 2012 Tymco sweeper. Staff recommends trading in the 2012 Tymco sweeper for the purchase of the Elgin Crosswind 1 Street Sweeper. The trade-in value of the 2012 Tymco Sweeper is $32,500.

The Elgin Crosswind 1 Street Sweeper and chassis is being purchased through the BuyBoard Cooperative Purchasing Program. Funding will be from the Sales Tax Street Improvement Fund.

Funding Expected: Revenue ☐ Expenditure ☐ N/A ☐ **Budgeted Item:** Yes ☒ No ☐ N/A ☐

Funding Account: 312-5501-00-4150 **Amount:** $232,431.25 **1295 Form Required?** Yes ☐ No ☒

Legal Review Required: N/A ☐ Required ☐ **Date Completed:** 12/30/2020 SLH

Supporting documents attached:

- Elgin Crosswind 1 sweeper BuyBoard quote
- Chassis Specifications

Recommendation: Move to approve the purchase of an Elgin Crosswind 1 Street Sweeper from Kinloch Equipment and Supply, Inc., through the BuyBoard Cooperative Purchasing Program in an amount not to exceed $232,431.25.

Reviewed by Department Head, if applicable ☐
Reviewed by Chief Financial Officer, if applicable ☒
Reviewed by City Attorney, if applicable ☒
Reviewed by City Manager ☒

Kinloch Equipment & Supply, Inc.

Presents a Proposal Summary

of the

ELGIN
Built for clean. Backed for life.

Crosswind 1

Crosswind 1 Regenerative Air Street Sweeper with Single Engine

for

Aloin
TEXAS

Morgan Kinloch Taylor
Tel: 281.620.1827

Quote Number: 2019-33675

PRODUCT DESCRIPTION

· Equipped with Memory Sweep;8.0 cu. Yd. Hopper, dual side brooms, sweeper is powder coated from powder coatings chart 2003/N with powder coated gray undercarriage.

STANDARD FEATURES

· Alternator, 95 amp
· Backup Alarm, electric
· Blower, 20,000 CFM rating with Linatex lined housing
· Brooms, hydraulic rotation
· Brooms, Dual with side broom lights for night operation
· Broom Measurement Ruler
· Camera, rear mounted
· Console, w/rocker switches for all sweep functions, including memory sweep with full gauge package including tachometer, engine hour meter, oil pressure indicator, coolant temperature, voltmeter and fuel lever indicator, water level gauge and warning lights for hopper pressure controls and manual reset circuit breakers
· Doors, access fiberglass doors provide easy service on electrical system
· Electronic Throttle, sweep resume/sweep transport/reverse pick-up
· Hopper rear door, hydraulically opened/closed and locked/unlocked with external controls.
· Hose, hydrant fill, 16' 8" with coupling
· In-Cab Hopper Dump
· LED Clearance Lights
· Lights, rear clearance and rear identification
· Manuals, operator and parts
· Mirrors, West Coast type with 8" convex inserts, one each side
· Pick-up head, hydraulically operated, 14” (355 mm) outside diameter pressure hose, 12-3/4” (324mm) inside diameter suction hose with quick disconnect on suctions side
· Spray nozzles, sixteen (16), seven (7) in the pick-up head, three (3) in the suction nozzle, three (3) at each side broom
· Side Broom Outer Position Stop
· Trans Oil Cooler
· Vacuum enhancer, in-cab operated
· Water tank, molded polyethylene, 240 gallons (907L)
· Water pre-filter, hydrant fill hose
· AM/FM/CD Radio
· Left Hand Fender Mirror
· Right and Left Hand Heated And Remote Controlled Mirrors
· Red Logo
· 1 Year Parts and Labor Warranty
· Sweeper - Operator Manual
· Sweeper Parts Manual

ADDITIONAL FEATURES

· Memory Sweep
· Variable Speed - Dual Sidebrooms
· Sidebroom Tilt Option Right Hand
· Lifeliner™ Hopper System
· Right Hand Inspection Door with Step and Handle
· Front Spray Bar
· Functional Control of Water System
· Hopper Deluge
· Low Pressure Washdown
· Hydraulic Oil Level Gauge W/ Thermometer on Tank
· Cab & Rear LED Strobe with LED Arrowstick
· Dual LED Sidebroom Lights
· Individual Switches for Dual Sidebroom Lights-LED

Price F.O.B. Alvin, TX	**$269,931.25**
O'Brien Trailer Jet Trade In*	**($5,000)**
Tymco 600 Trade In*	**($32,500)**
Total, less both trade in values	**$232,431.25**

Product Model: CROSSWIND 1

Proposal Date: 10/8/2020

Quote Number: 2019-33675

Price List Date: 9/9/2019

Proposal Notes:

1. Prices quoted herein are in accordance with BuyBoard Contract Number 597-19.
2. Prices quoted herein are firm until 1/31/21.
3. Unit offered is in stock and available for immediate delivery but subject to prior sale or rental.
4. The City of Alvin may choose to take either, both, or neither of the trade in options at their discretion. *

LIMITED WARRANTY

ELGIN SWEEPER COMPANY warrants each new machine manufactured by it against defects in material and workmanship provided the machine is used in a normal and reasonable manner. This warranty is extended only to the original user-purchaser for a period of twelve (12) months from the date of delivery to the original user-purchaser.

ELGIN SWEEPER COMPANY will cause to be repaired or replaced, as the Company, may elect, any part or part of such machine which the Company's examination discloses to be defective in material or workmanship.

Repairs or replacements are to be made at the selling Elgin distributor's location or at other locations approved by ELGIN SWEEPER COMPANY.

The ELGIN SWEEPER COMPANY warranty shall not apply to:

1. Major components or trade accessories such as but not limited to, trucks, engines, tires or batteries that have a separate warranty by the original manufacturer.
2. Normal adjustments and maintenance services.
3. Normal wear parts such as but not limited to, broom filters, broom wire, shoe runners and rubber deflectors.
4. Failures resulting from the machine being operated in a manner or for a purpose not recommended by ELGIN SWEEPER COMPANY.
5. Repairs, modifications or alterations without the consent of ELGIN SWEEPER COMPANY which, in the Company's sole judgment, have adversely affected the machine's stability or reliability.
6. Items subjected to misuse, negligence, accident or improper maintenance.

The use in the product of any part other than parts approved by ELGIN SWEEPER COMPANY may invalidate this warranty. ELGIN SWEEPER COMPANY reserves the right to determine, in its sole discretion, if the use of non-approved parts operates to invalidate the warranty.

Nothing contained in this warranty shall make ELGIN SWEEPER COMPANY liable for loss, injury, or damage of any kind to any person or entity resulting from any defect or failure in the machine.

TO THE EXTENT LIMITED BY LAW, THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND **FITNESS FOR A PARTICULAR PURPOSE.**

This warranty is also in lieu of all other obligations or liabilities on the part of ELGIN SWEEPER COMPANY, including but not limited to, liability for incidental and consequential damages on the part of the Company or the seller.

ELGIN SWEEPER COMPANY makes no representation that the machine has the capacity to perform any functions other than as contained in the Company's written literature, catalogs or specifications accompanying delivery of the machine.

No person or affiliated company representative is authorized to give any other warranties or to assume any other liability on behalf of ELGIN SWEEPEAR COMPANY in connection with the sale, servicing or repair of any machine manufactured by the Company.

ELGIN SWEEPER COMPANY reserves the right to make design changes or improvements in tis products without imposing any obligation upon itself to change or improve previously manufactured products.

DETAILED SPECIFICATIONS
FOR

City of Alvin's CROSSWIND 1 Freightliner M-2 Chassis

1.0	**CHASSIS 2021 Model Year Freightliner M2 (Dual Steering)**
1.01	Chassis shall be conventional design with 33,000 GVW rating.
1.02	Wheelbase shall not exceed 176 inches.
1.03	Cab to axle shall be not more than 106 inches.
1.04	Yield strength of the Rail, High Strength, 80,000 PSI, 9/32" X 3 7/16" X 10 1/8".
1.05	For safety, the rear of the sweeper shall be equipped with a rear panel to provide under ride protection. When dumping debris, material shall not be discharged on top of the rear panel.
1.06	Front tow hooks shall be provided
1.07	One- (1) 50-gallon fuel tank shall be easily accessible without raising or shifting any components. A fuel gauge, in cab, shall be supplied. Sight tube is not acceptable.
1.08	Diesel emissions shall be 2016-2019 on board diagnostics/2010 EPA/CARB/Final GHG17 Configuration, and have a minimum capacity of 6 U.S. gallons diesel emissions fluid.
2.0	**CHASSIS ENGINE**
2.01	Truck engine shall be, Cummins ISB 6.7-200 or equivalent, turbocharged diesel, 200 HP @ 2400 RPM, 520ft-lbs. @ 1600 RPM.
2.02	Truck engine shall be equipped with a single vertical exhaust system.
2.03	The cooling system shall be protected to -34 degrees F.
2.04	Engine shall be equipped with block heater.
2.05	Radiator fan shall be viscous drive type.
3.0	**TRANSMISSION, AXLES, WHEELS & BRAKES**
3.01	An Allison 2500 RDS series (or approved equal) automatic transmission shall be provided.
3.02	A variable speed device shall be installed between the chassis engine and the Allison transmission allowing efficient use of chassis engine power for sweeper operation and variable travel speed while sweeping.
3.03	Variable speed device shall produce a 1:1 speed ratio between the chassis engine and the Allison transmission while the sweeper is in "Road Mode".
3.03.a	Variable speed device shall have a selectable "Road Mode", herein referred to as controlling the chassis engine speed and transmission shifts normally through accelerator pedal(s); i.e. driving the chassis on the road for transport.
3.04	Variable speed device shall allow chassis accelerator pedal(s) control input speed to the Allison transmission while chassis engine speed remains constant when the sweeper is in "Work Mode".
3.04.a	Variable speed device shall have a selectable "Work Mode", herein referred to as controlling and operating the sweeper using variable speed device to allow complete utilization of sweeper system.
3.07	For ease of operation, the variable speed device shall be in-cab controlled via singular push-button switch located on control console.
3.08	Engaging either "Work Mode" or "Road Mode" shall NOT require the parking brake to be engaged or the chassis to be placed into neutral. A variable speed device increases operator productivity through the elimination of predecessor transfer cases or split-shaft single-engine technology; perceived as having operationally cumbersome procedures.
3.09	Single-speed rear axle shall have a ratio of 7.17:1 for proper sweeping speeds.
3.10	Front axle shall be 12,000 and be equipped with taperleaf front suspension and shock absorbers.
3.11	The rear axle shall be 21,000 lb.
3.12	For safety, and to allow the emergency interchange of tires at a job site, the front and rear tires and rims shall be interchangeable.
3.13	Tires shall be tubeless radial tires 14 ply 11R22.5 "G" load rated. The rear axle shall include dual

	tires for load capacity; singles will not be acceptable.
3.14	Rims shall be 10 hole steel hub piloted 22.5 x 8.25
3.15	Parking brake shall be spring applied rear wheel drum and shoe.
3.16	Brakes shall be full air brakes S Cam with a 18.7 CFM capacity compressor, with automatic slack adjusters and ABS.
3.17	Air system shall include a Bendix AD-9 air dryer with heater.
4.0	**CAB**
4.01	Maximum visibility, forward line of sight from the chassis front bumper to the point on the ground visible to the operator shall not exceed 8 feet for an SAE 98th percentile size operator.
4.02	Steering shall be full power with dual operator controls.
4.03	Seats shall be basic adjustable, high back air suspension, covered with cloth for air circulation and include 3 point seat belts.
4.04	Sweeper shall include two (2) heated and remote control, outside west coast type mirrors with lower 8 inch convex lens for easy viewing of the side broom during sweeping.
4.05	To maximize operator visibility of the curb and sweeping gear, an 8 inch outside RH and LH fender mirrors shall be mounted forward of the front wheels.
4.06	For safety during night sweeping, switches shall be illuminated so that they can be readily identified without the use of the cab dome light.
4.07	Switches shall be clearly identified by name and symbol.
4.08	Cab interior environment shall be fully air-conditioned including a fresh air heater/ventilator/defroster.
4.09	Cab shall have full flow through ventilation for optimal temperature control and operator comfort.
4.10	Wipers shall have intermittent feature.
4.11	Interior of cab shall have acoustical insulation for low operating noise, automotive type trim, and center sweeper console.
4.12	Dash shall be faced with soft molded plastic.
4.13	All glass shall be tinted safety glass.
4.14	Each operator position shall have adjustable sun visor.
4.15	Doors shall be keyed alike with electric locks.
4.16	Door windows shall be electric open/close type.
4.17	Side windows shall have defogger.
4.18	Cab shall include 12V power supply
4.19	Cab shall include a AM/FM/WB Radio w/ CD Player, Bluetooth and Microphone, USB, Front and Rear Aux. Inputs. Speakers and antenna shall be included.
4.20	Dual Electric horns shall be provided.
5.0	**INSTRUMENTS**
5.01	Chassis left side operator instrument panel shall be chassis OEM, full vision illuminated with tachometer, speedometer, odometer, trip odometer, hour meter, trip hour meter, fuel gauge, water temperature gauge, oil pressure gauge, transmission temperature gauge, air pressure gauge, and volt gauge.
5.02	Chassis right side operator instrument panel shall be chassis OEM, full vision illuminated with tachometer, speedometer, odometer, trip odometer, fuel gauge, water temperature gauge, oil pressure gauge, transmission temperature gauge, air pressure gauge, and volt gauge.
5.03	Chassis engine instruments shall include warning light and chime for low coolant level and high coolant temperature to warn the operator of a potential problem before any damage to the engine occurs.
5.04	Console shall have left/right primary driver switch.
5.05	Hydraulic functions shall be controlled by rocker switches located in the cab mounted control panel.
5.06	Truck instruments shall include warning lights for battery.
5.07	All console switches including transmission controls and all gauges shall be illuminated.
5.08	Intake mounted air restriction indicator with graduations.
6.0	**ELECTRICAL**

6.01	Batteries should be located in an enclosed accessible environment for long life and ease of service.
6.02	Chassis shall have two (2) maintenance free batteries rated at not less than 1900 CCA total, 12 volt.
6.03	Chassis engine shall have a 160 amp alternator.
6.04	Chassis lighting shall include sealed multi-beam halogen head-lights, stop lights with daytime running feature, tail lights, backup lights, license plate lights, clearance lights, signal lights, illuminated gauges and instrument panel, and directional lights with hazard switch.
7.0	**OTHER CHASSIS ACCESSORIES**
7.02	One (1) fender mounted 8" convex mirror with stainless steel tripod mount is provided to increase operator visibility.
7.03	4 way dual brite finished west coast left and right hand mirrors with remote and heated control switch mounted in the cab. 8" convex mirrors are mounted below the west coast mirrors.

AGENDA COMMENTARY

Meeting Date: 1/7/2021

Department: City Attorney **Contact:** Suzanne Hanneman, City Attorney

Agenda Item: Consider Resolution 21-R-03, approving the Development Agreement between the City of Alvin, Texas, the Brazoria-Fort Bend Counties Municipal Utility District No. 3, D.R. Horton-Texas, Ltd., and 258 Colony Investments, Ltd.; and authorize the Mayor to sign the Agreement upon legal review.

Type of Item: ☐Ordinance ☒Resolution ☐Contract/Agreement ☐Public Hearing ☐Plat ☐Discussion & Direction ☐Other

Summary: D.R. Horton-Texas, Ltd., and 258 Colony Investments, Ltd. own property in Brazoria-Fort Bend Counties MUD 3, which is partially located in the extraterritorial jurisdiction (ETJ) of the City of Alvin, and partially within the ETJ of the City of Missouri City, Texas. On October 1, 2020, in Ordinance 20-Z, the City of Alvin released the portion of its ETJ in Fort Bend County. The MUD and the Owners have requested the City retain the ETJ in Fort Bend County, and forego releasing it, until such time as all plats and plans are approved by the City of Alvin, and construction of the District facilities within the platted areas is complete. State law allows a MUD located in multiple ETJs to elect the municipality over which to have authority, and the MUD has selected Alvin. Finally, in addition to the applicable platting and planning fees as set forth in Chapter 28 of the Code of Ordinances of the City, the Owner has agreed to compensate the City an additional fee of seventy-five dollars ($75.00) per lot for each single-family home lot located within a plat, with approximately 699 lots to be platted.

Staff recommends approval of Resolution 21-R-03 and the Development Agreement.

Funding Expected: Revenue ☐ Expenditure ☐ N/A ☒ **Budgeted Item:** Yes ☐ No ☐ N/A ☒

Funding Account:_____ **Amount:** _____ **1295 Form Required?** Yes ☐ No ☒

Legal Review Required: N/A ☐ Required ☒ **Date Completed:** 12/22/2020 SLH

Supporting documents attached:

- Resolution 21-R-03
- Development Agreement for Municipal Utility District No. 3

Recommendation: Move to approve Resolution 21-R-03, approving the Development Agreement between the City of Alvin, Texas, the Brazoria-Fort Bend Counties Municipal Utility District No. 3, D.R. Horton-Texas, Ltd., and 258 Colony Investments, Ltd.; and authorize the Mayor to sign the Agreement upon legal review.

Reviewed by Department Head, if applicable ☐
Reviewed by City Attorney, if applicable ☒
Reviewed by Chief Financial Officer, if applicable ☒
Reviewed by City Manager ☒

RESOLUTION NO. 21-R-03

A RESOLUTION OF THE CITY OF ALVIN, TEXAS, ADOPTING THE DEVELOPMENT AGREEMENT BETWEEN THE CITY OF ALVIN, TEXAS, BRAZORIA-FORT BEND COUNTIES MUNICIPAL UTILITY DISTRICT NUMBER 3, D.R. HORTON-TEXAS, LTD., AND 258 COLONY INVESTMENTS, LTD.; AND SETTING FORTH RELATED MATTERS THERETO.

WHEREAS, the City of Alvin is a home rule municipal corporation that provides a full-range of governmental services to its citizens; and

WHEREAS, Brazoria-Fort Bend Counties Municipal Utility District No. 3 (the "District"), is a conservation and reclamation district and a political subdivision of the State of Texas, created by order of the Texas Commission on Environmental Quality; and

WHEREAS, D.R. Horton-Texas, Ltd., a Texas limited partnership and 258 Colony Investments, Ltd., a Texas limited partnership (collectively referred to herein as the "Owner"), is the owner of property located within Brazoria-Fort Bend Counties Municipal Utility District No. 3, and the Property (as defined in the Development Agreement), is developable land within the District, and the Owner anticipates development activities occurring thereon; and

WHEREAS, the Property is partially located within the extraterritorial jurisdiction of Alvin, Texas, and partially in the extraterritorial jurisdiction of the City of Missouri City, Texas; and

WHEREAS, on October 1, 2020, in Ordinance 20-Z, Alvin released its ETJ as to a portion of the Property, and the District has requested Alvin forgo releasing its ETJ under Section 42.023 of the Texas Local Government Code as it pertains to the Property; and

WHEREAS, Alvin is agreeable to maintaining the ETJ status of the Property until all plats and plans sought for approval by the Owner of the Property are approved by Alvin and construction of the District facilities within such platted areas is complete; and

WHEREAS, the Owner is willing to pay for platting, planning, and related fees to remain in the ETJ of Alvin; and

WHEREAS, the City, District and Owner have the authority to enter into the Development Agreement pursuant to Section 212.171, *et seq.*, of the Texas Local Government Code; and

WHEREAS, the Development Agreement is found by the City Council of the City of Alvin, Texas, to be in the public interest to authorize this action;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ALVIN, TEXAS:

Section 1. Findings. The foregoing recitals are hereby found to be true and correct and are hereby adopted by the City Council and made a part hereof for all purposes as findings of fact.

Section 2. That the City Council of Alvin, Texas, hereby adopts the Development Agreement between the City of Alvin, Texas, Brazoria-Fort Bend Counties Municipal Utility District Number 3, D.R. Horton-Texas, Ltd., And 258 Colony Investments, Ltd., including the exhibits, attached hereto and made a part hereof for all purposes.

Section 3. Open Meetings. It is hereby officially found and determined that the meeting at which this resolution was passed was open to the public as required and that public notice of the time, place, and purpose of said meeting was given as required by the Open Meetings Act, Chapter 551 of the Texas Government Code.

PASSED AND APPROVED on this the 7th day of January 2021.

THE CITY OF ALVIN, TEXAS	**ATTEST**
_____	_____
Paul A. Horn, Mayor	Dixie Roberts, City Secretary

DEVELOPMENT AGREEMENT
BY AND BETWEEN BRAZORIA-FORT BEND COUNTIES MUNICIPAL UTILITY DISTRICT NO. 3, THE CITY OF ALVIN, TEXAS, D.R. HORTON-TEXAS, LTD, AND 258 COLONY INVESTMENTS, LTD

This DEVELOPMENT AGREEMENT ("Agreement") is entered into as of _____, 2020 ("Effective Date"), by and between the City of Alvin, a home-rule city located in Brazoria County, Texas (the "City" or "Alvin"); Brazoria-Fort Bend Counties Municipal Utility District No. 3, a political subdivision of the State of Texas, operating under the provisions of Article III, Section 52, and Article XVI, Section 59, of the Texas Constitution and Chapters 49 and 54, Texas Water Code, as amended (the "District"); and D.R. HORTON-TEXAS, LTD., a Texas limited partnership and 258 COLONY INVESTMENTS, LTD., a Texas limited partnership (collectively referred to herein as the "Owner").

RECITALS

WHEREAS, Owner is the owner of the approximately 565.339 acres of land described in Exhibit "A" attached hereto and depicted in the map attached hereto as Exhibit "B" ("Property"), which is located within the boundaries of the District; and

WHEREAS, the Property is partially located in the extraterritorial jurisdiction ("ETJ") of Alvin and partially in the ETJ of the City of Missouri City, Texas; and

WHEREAS, pursuant to Section 54.0163 of the Texas Water Code, the board of directors of a district that is located in the ETJ of more than one municipality may, by resolution, select the municipality that may exercise authority within the district as a whole; and

WHEREAS, on December 8, 2020, the District passed a Resolution Selecting Extraterritorial Jurisdiction declaring that the Property be wholly in the ETJ of Alvin under Section 54.0163 of the Texas Water Code; and

WHEREAS, Section 42.023of the Texas Local Government Code authorizes Alvin to release its ETJ by ordinance or resolution; and

WHEREAS, on October 1, 2020, in Ordinance 20-Z, Alvin released its ETJ as to a portion of the Property; and

WHEREAS, the District has requested Alvin forgo releasing its ETJ under Section 42.023 of the Texas Local Government Code as it pertains to the Property; and

WHEREAS, Alvin is agreeable to maintaining the ETJ status of the Property until all plats and plans sought for approval by the Owner of the Property are approved by Alvin and construction of the District facilities within such platted areas is complete; and

WHEREAS, the Owner is willing to pay for platting, planning, and related fees to remain in the ETJ of Alvin; and

WHEREAS, the City, District and Owner have the authority to enter into this Agreement pursuant to Section 212.171, *et seq.*, of the Texas Local Government Code; and

WHEREAS, the City, District and Owner intend that this Agreement be a development agreement as provided for by of Section 212.172 of the Texas Local Government Code.

AGREEMENT

NOW, THEREFORE, for and in consideration of the mutual promises, covenants, obligations and benefits of this Agreement, and other good and valuable consideration, the receipt of which are hereby acknowledged, the City, District and Owner agree as follows:

ARTICLE I
MAINTAIN ETJ STATUS

The City agrees to maintain the ETJ status of the Property until such time as all plats and plans sought for approval by the Owner of the Property are approved by the City and construction of the District facilities within such platted areas is complete.

ARTICLE II
PLATTING AND PLANNING FEES

2.1. Platting and Planning Fees. Beginning on the Effective Date of this Agreement, Owner shall pay applicable platting and planning fees as set forth in Chapter 28 of the Code of Ordinances of the City, and an additional fee of seventy-five dollars ($75.00) per lot for each single-family home lot located within a plat, which fee shall be due at the time the plat is submitted for review by the City.

2.2. Platting and Planning Submission. Owner shall not submit more than one (1) final plat and associated construction plans per month for review by the City, not including construction plans for Utility Facilities as addressed below.

2.3. Utility Facilities. The term "Utility Facilities" shall mean utility facilities necessary to accomplish the purposes of Section 52, Article III, and Section 59, Article XVI, of the Texas Constitution and operated pursuant to Chapters 49 and 54 of the Texas Water Code, sought to be constructed within the boundaries of the Property, that are not located in a platted section of the Property.

2.4. Construction Plans For Utility Facilities. Owner shall not submit more than one (1) construction plan for any Utility Facilities per month for review by the City.

ARTICLE III
TERM OF AGREEMENT

This Agreement shall remain in effect until the earlier of (i) such time as all plats and plans sought for approval by the Owner of the Property are approved by the City and

construction of the District facilities within such plats is complete; or (ii) four (4) years from the Effective Date of this Agreement.

ARTICLE IV
MISCELLANEOUS PROVISIONS

4.1. Default; Remedies. No party shall be in default under this Agreement until written notice of such party's alleged failure to perform has been given to all parties to this Agreement (including a detailed description of the alleged failure) and until such party has had a reasonable opportunity to cure the alleged failure (taking into consideration the nature and extent of the alleged failure, but in no event less than thirty (30) days after the notice is given). If a party is in default under this Agreement, the exclusive remedies of the non-defaulting party shall be injunctive relief, mandamus, or specific performance specifying the actions to be taken by or prohibited of the defaulting party and the actions, if any, permitted to be taken by the non-defaulting party to remedy the default. Such relief shall be directed solely to the failed obligation and the defaulting party and shall not address or include any activity or actions not directly related to the failed obligation.

4.2. Approvals and Consents. Approvals or consents required or permitted to be given under this Agreement by the City shall be in accordance with the City of Alvin Subdivision Ordinance Chapter 21. Approvals and consents shall be effective without regard to whether given before or after the time required for giving such approvals or consents.

4.3. Address and Notice. Unless otherwise provided in this Agreement, any notice to be given under this Agreement shall be given in writing and may be given either by depositing the notice in the United States mail postpaid, registered or certified mail, with return receipt requested; delivering the notice to an officer of such party; or sending the notice by facsimile, when appropriate. Notice deposited by mail in the foregoing manner shall be effective the day after the day on which it is deposited. Notice given in any other manner shall be effective only when received by the party to be notified. For the purposes of notice, the addresses of the parties shall be as follows:

If to Owner: D.R. Horton-Texas, Ltd.
Attn: Jonathan Woodruff
6744 Horton Vista Drive, Suite 100
Richmond, Texas 77407

258 Colony Investments, Ltd.
Attn: Brad Richie
Great America Companies, Inc.
10003 NW Military Highway, Suite 2201
San Antonio, Texas 78231

If to City: City of Alvin, Texas
Attn: Suzanne L. Hanneman
City Attorney
216 West Sealy Street

Alvin, Texas 77511

If to District: Brazoria-Fort Bend Counties Municipal Utility District No. 3
Attn: Laken Jenkins Kilgore
Coats Rose, P.C.
9 Greenway Plaza, Suite 1000
Houston, Texas 77046

The parties shall have the right from time to time to change their respective addresses by giving at least fifteen (15) days' written notice of such change to the other parties.

4.4. No Additional Waiver Implied. The failure of any party to insist upon performance of any provision of this Agreement shall not be construed as a waiver of the future performance of such provision by the other parties.

4.5. Reservation of Rights. All rights, powers, privileges and authority of the parties hereto not restricted or affected by the express terms and provisions hereof are reserved by the parties and, from time to time, may be exercised and enforced by the parties.

4.6. Merger. This Agreement embodies the entire understanding between the parties and there are no representations, warranties or agreements between the parties covering the subject matter of this Agreement.

4.7. Captions. The captions of each section of this Agreement are inserted solely for convenience and shall never be given effect in construing the duties, obligations or liabilities of the parties hereto or any provisions hereof, or in ascertaining the intent of either party, with respect to the provisions hereof.

4.8. Interpretations. This Agreement and the terms and provisions hereof shall be liberally construed to effectuate the purposes set forth herein and to sustain the validity of this Agreement.

4.9. Severability. If any provision of this Agreement or the application thereof to any person or circumstances is ever judicially declared invalid, such provision shall be deemed severed from this Agreement and the remaining portions of this Agreement shall remain in effect.

4.10. Amendments. This Agreement may only be amended by the mutual consent of the parties, including a resolution or ordinance of the City, and no City officer or official is authorized or empowered to vary or waive the terms of this Agreement absent such consent and resolution or ordinance.

4.11. Covenant Running with the Land. Subject to the limitations and release provisions contained in this section, this Agreement binds and constitutes a covenant running with the Property. This Agreement shall be recorded in the Official Public Records of Brazoria and Fort Bend Counties, Texas after its execution. As required by Section 212.172(f) of the Texas Local Government Code, subject to the provisions of Article III herein: (1) this Agreement is binding on the City and Owner and on their respective successors and assigns for the term of this Agreement; however (2) this Agreement is not binding on, and does not create any encumbrance

to title as to, any end-buyer of a fully developed and improved lot within the Property. For purposes of this Agreement, the City and Owner agree that the term "end-buyer" means any owner, lessee, or occupant; and that the term "fully developed and improved lot" means any lot, regardless of proposed use, for which the City has approved a final plat. The City and Owner further agree that this Agreement shall not be binding upon any property (whether or not platted) used or intended to be used for a church, school, police/fire/EMS facility, library, public park, public community center, or any other public use.

4.12. Authority. By executing below, City and Owner agree that they have all necessary authority to enter into this Agreement, including any necessary approval by partners, directors or council members. In particular, the parties intend that this Agreement shall constitute an agreement entered into pursuant to the authority of Subchapter G, Chapter 212of the Texas Local Government Code.

4.13. Required Verifications. As required by Chapter 2270 of the Texas Government Code, Owner hereby verifies that neither it, not any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same, boycotts Israel and will not boycott Israel through the term of this Agreement. For purposes of this verification, "boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes. Pursuant to Chapter 2252of the Texas Government Code, Owner represents and certifies that, at the time of the execution of this Agreement neither Owner, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same (i) engages in business with Iran, Sudan, or any foreign terrorist organization as described in Chapter 2270 of the Texas Government Code, or Subchapter F of Chapter 2252 of the Texas Government Code, or (ii) is a company listed by the Texas Comptroller of Public Accounts under Sections 2270.0102, 2270.0052, or 2252.153 of the Texas Government Code. The term "foreign terrorist organization" in this paragraph has the meaning assigned to such term in Section 2252.151 of the Texas Government Code.

[*signature page follows*]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in multiple copies, each of equal dignity, as of the date and year set forth in the first page hereof.

CITY:

CITY OF ALVIN, TEXAS

_____
Paul A. Horn, Mayor

ATTEST:

_____
Dixie Roberts, City Secretary

APPROVED AS TO FORM
AND LEGALITY

_____
Suzanne L. Hanneman, City Attorney

STATE OF TEXAS §
§
COUNTY OF BRAZORIA §

This instrument was acknowledged before me on this ___ day of _____, 20__, by _____, Mayor of Alvin, Texas.

_____
Notary Public, State of Texas

(SEAL)

DISTRICT:

BRAZORIA-FORT BEND COUNTIES
MUNICIPAL UTILITY DISTRICT NO. 3

ATTEST:

_____
Secretary, Board of Directors

By: _____
President, Board of Directors

(DISTRICT SEAL)

STATE OF TEXAS §
§
COUNTY OF _____ §

This instrument was acknowledged before me on this ____ day of _____, 20__, by _____, as _____, and _____, as _____, respectively, of the Board of Directors of Brazoria-Fort Bend Counties Municipal Utility District No. 3, on behalf of said Municipal Utility District.

_____
Notary Public, State of Texas

(SEAL)

"OWNER"

D.R. Horton-Texas, Ltd.,
a Texas limited partnership

By: D.R. Horton, Inc.,
a Delaware corporation
Authorized Agent

By: _____

Name:_____

Title:_____

STATE OF TEXAS §
§
COUNTY OF _____ §

This instrument was acknowledged before me on the _____ day of _____, 2020, by _____, _____ of D.R. Horton, Inc., a Delaware corporation, the authorized agent of D.R. Horton-Texas, Ltd, a Texas limited partnership, on behalf of said entity.

_____
Notary Public, State of _____

(SEAL)

258 COLONY INVESTMENTS, LTD.
A Texas limited partnership

By: FW Companies, LLC
a Texas limited liability company
its General Partner

By: _____
Name: Brad Richie
Title: Secretary

STATE OF TEXAS §
§
COUNTY OF _____ §

This instrument was acknowledged before me on the _____ day of _____, 2020, by Brad Richie, Secretary of FW Companies, LLC, a Texas limited liability company, the General Partner of 258 Colony Investments, Ltd., a Texas limited partnership, on behalf of said entity.

_____
Notary Public, State of _____

(SEAL)

EXHIBIT “A”
Property Description

EXHIBIT “B”
Property Depiction

Agenda Commentary

Meeting Date: 1/7/2021

Department: Engineering **Contact:** Michelle Segovia, City Engineer

Agenda Item: Consider an Engineering Services Agreement with Freese and Nichols, Inc. in an amount not to exceed $380,000 for engineering design services for the Wastewater Master Plan, Sanitary Sewer Evaluation Study, and Water and Wastewater Rate Study; and authorize the City Manager to sign the Agreement upon legal review.

Type of Item: ☐Ordinance ☐Resolution ☒Contract/Agreement ☐Public Hearing ☐Plat ☐Discussion & Direction ☐Other

Summary: The Engineering Services Agreement being considered will provide an update to the Wastewater portion of the City's 2015 Utility Master Plan, provide an evaluation of the City's West-Central and Central Sanitary Sewer Basins, and provide a Water and Wastewater Rate Study (the last one was done in 2016). It is proposed that design services culminating in a Wastewater Master Plan Report, a technical memorandum detailing the survey results and system improvement alternatives in the West-Central and Central Sanitary Basins, and Utility Rate Study Report will be complete in a period of eighteen months. These studies were approved in the FY 2021 budget and will be funded from the Utility Project Fund.

Staff recommends approval of this Agreement.

Funding Expected: Revenue ☐ Expenditure ☒ N/A ☐ **Budgeted Item:** Yes ☐ No ☐ N/A ☐

Funding Account: 220-6001-00-3100 220-6003-00-3100 **Amount:** $380,000 **1295 Form Required?** Yes ☐ No ☐

Legal Review Required: N/A ☐ Required ☒ **Date Completed:** 12/30/2020 SLH

Supporting documents attached:

- Freese Proposal for Wastewater Master Plan, Sanitary Sewer Evaluation Study, and Water and Wastewater Rate Study

Recommendation: Move to approve an Engineering Services Agreement with Freese and Nichols, Inc. in an amount not to exceed $380,000 for engineering design services for the Wastewater Master Plan, Sanitary Sewer Evaluation Study, and Water and Wastewater Rate Study; and authorize the City Manager to sign the Agreement upon legal review.

Reviewed by Department Head, if applicable ☒
Reviewed by City Attorney, if applicable ☒
Reviewed by Chief Financial Officer, if applicable ☒
Reviewed by City Manager ☒

FREESE AND NICHOLS
Innovative approaches
Practical results
Outstanding service
11200 Broadway Street, Suite 2320 • Pearland, Texas 77584 • 832-456-4700 • FAX 817-735-7491 www.freese.com

January 7, 2021

Michelle Segovia, P.E., CFM, City Engineer
City of Alvin, Texas
1100 West Highway 6
Alvin, Texas 77511

RE: PSA FOR WASTEWATER MASTER PLAN, SSES AND WATER AND WASTEWATER RATE STUDY, CITY OF ALVIN, TEXAS

Dear Ms. Segovia:

Freese and Nichols is pleased to provide the attached professional services agreement for a Wastewater Master Plan, Sanitary Sewer Evaluation Study (SSES), and Water and Wastewater Rate Study. FNI proposes to conduct the attached scope of services for a lump sum fee of **$380,000**.

We are ready to begin work upon execution of a contract, and we are looking forward to working with the City on this study.

Sincerely,

Kendall J. Ryan

Kendall J. Ryan, PE
Project Manager
(832) 456-4732
Kendall.Ryan@freese.com

CC: Jared Barber, PE, Richard Weatherly, PE, David Munn, PE

Rev. 4/19

PROFESSIONAL SERVICES AGREEMENT

STATE OF TEXAS §

COUNTY OF TARRANT §

This Agreement is entered into by City of Alvin, hereinafter called "Client" and Freese and Nichols, Inc., hereinafter called "FNI." In consideration of the Agreements herein, the parties agree as follows:

I. **EMPLOYMENT OF FNI:** In accordance with the terms of this Agreement, Client agrees to employ and compensate FNI to perform professional services in connection with the Project. The Project is described as **Wastewater Master Plan Update, Sanitary Sewer Evaluation Study and Water and Wastewater Rate Study**.

II. **SCOPE OF SERVICES:** FNI shall render professional services in connection with Project as set forth in Attachment SC – Scope of Services and Responsibilities of Client which is attached to and made a part of this Agreement.

III. **COMPENSATION:** Client agrees to pay FNI for all professional services rendered under this Agreement. FNI shall perform professional services as outlined in the "Scope of Services" for a lump sum fee of Three Hundred Eighty Thousand Dollars, $380,000.

If FNI's services are delayed or suspended by Client, or if FNI's services are extended for more than 60 days through no fault of FNI, FNI shall be entitled to equitable adjustment of rates and amounts of compensation to reflect reasonable costs incurred by FNI in connection with such delay or suspension and reactivation and the fact that the time for performance under this Agreement has been revised.

IV. **TERMS AND CONDITIONS OF AGREEMENT:** The Terms and Conditions of Agreement as set forth as Attachment TC – Terms and Conditions of Agreement shall govern the relationship between the Client and FNI.

Nothing under this Agreement shall be construed to give any rights or benefits in this Agreement to anyone other than Client and FNI, and all duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of Client and FNI and not for the benefit of any other party.

This Agreement constitutes the entire Agreement between Client and FNI and supersedes all prior written or oral understandings.

This contract is executed in two counterparts. IN TESTIMONY HEREOF, Agreement executed:

Freese and Nichols, Inc.

By: Richard Weatherly

Richard Weatherly, PE
Print Name and Title

Date: January 4, 2021

ATTEST: Stephanie Stephenson

City of Alvin

By: _____

_____
Print Name and Title

Date: _____

ATTEST: _____

SCOPE OF SERVICES AND RESPONSIBILITIES OF CLIENT

PROJECT UNDERSTANDING

Freese and Nichols, Inc. (FNI) will develop a Wastewater Master Plan Update, Sanitary Sewer Evaluation Study (SSES), and Water & Wastewater Rate Study for the City of Alvin (City).

Wastewater Master Plan Update and Sanitary Sewer Evaluation Study

FNI will update the City's current wastewater master plan to develop a guiding document for the future of wastewater in Alvin. Five-year (2025), 10-year (2030), and 20-year (2040) planning periods will be included.

FNI will also conduct a Sanitary Sewer Evaluation Study (SSES) in portions of the Alvin collection system (SSES study area) to identify sources and causes of inflow and infiltration (I/I) and develop proposed rehabilitation/improvement recommendations. The goal of the SSES is to provide actionable information about the condition of collection system assets in order to reduce I/I in the collection system. The SSES study area for this Project will consist of the following two (2) wastewater basins identified during the City's 2015 Utility Master Plan: 1) West-Central Basin, and 2) Central Basin.

Water and Wastewater Rate Study

FNI will develop a comprehensive water and wastewater rates, fees, and charges study (rate study) for the City. The rate study will include a cost of service analysis to determine the costs associated with customers located both within and outside the City limits. At the conclusion of this study, the City will be provided with the following:

- Multi-year revenue requirements and accompanying scenarios for water and wastewater rates designed to meet the City's overall rate-design goals, including providing sufficient revenue to implement needed capital improvements.
- A water and wastewater rate study report documenting the findings and results of the rate study and the recommended utility rates.

The project tasks are broken down in the following **Table 1**:

Table 1: Wastewater Master Plan Update, SSES and Water and Wastewater Rate Study Tasks

Task	Basic Services Task Description
Wastewater Master Plan Update and SSES	
A	Project Management
B	Field Data Collection
C	Land Use Assumptions and Wastewater Load Projections
D	Hydraulic Model Update and Calibration
E	Existing and Future System Analysis
F	Capital Improvements Plan and SSES Improvement Recommendations
G	Wastewater Master Plan Report and SSES Technical Memorandum
Water and Wastewater Rate Study	
H	Rate Study Data Collection and Rate Model Development
I	Project Operating Expenses and Revenue
J	Develop Revenue Requirements
K	Develop Cost of Service
L	Develop Rate Structures and Rate Study Report

ARTICLE I

BASIC SERVICES: Freese and Nichols, Inc. (FNI) shall render the following professional services to the City of Alvin (OWNER) in connection with the development of the Project, described as: Wastewater Master Plan Update, Sanitary Sewer Evaluation Study (SSES), and Water and Wastewater Rate Study.

TASK A: PROJECT MANAGEMENT

A1. Project Kickoff Meeting

Conduct a project kickoff meeting with the City to review project scope, goals, project team members and schedule. FNI will provide the City with a data request memorandum identifying data needs. The meeting will include discussion of the following:

- Present and discuss methodology and approach
- Scheduling and project coordination
- Information and data needs from the City

Throughout the project, monthly status updates will be submitted that summarize progress and document upcoming tasks. The monthly status updates will outline any upcoming key decisions which will require input from or discussion with the City.

A2. Initial Data Collection and Review

FNI will coordinate with and compile information from the City, including GIS/CAD files, as-built drawings, lift station layouts, pump curves, treatment facility layouts, recently completed collection system improvements, water consumption and production data, operational data, and wastewater flow data.

TASK B: FIELD DATA COLLECTION

B1. Temporary Flow Monitoring Site Selection and Basin Delineation

Select preliminary flow monitor sites, produce mapping and review with City staff. Perform field investigations to verify access, site hydraulics, and sewer line connectivity. Adjust sites as/if necessary. Delineate flow monitor basins based on verified flow monitor locations.

B2. Temporary Flow Monitor Installation, Calibration, and Data Collection

Install and calibrate sixteen (16) temporary flow monitors at the field verified locations as well as three (3) rainfall gauges. Temporary flow monitors and rain gauges shall remain in place for a minimum of forty-five (45) days.

B3. Flow Data Analysis and Evaluation

Analyze wastewater flow monitoring field data and prepare flow and depth hydrographs for each flow monitoring location. The flow data will be summarized showing average dry weather flow and peak wet weather flows at each flow monitor site. Rainfall events will also be summarized for total depth and duration. Using the rainfall and inflow/infiltration data, figures showing I/I by wastewater basin will be created.

B4. Proposed Sub Basins for SSES Field Activities

FNI will select sub basins for SSES field activities (Task B6). The number of sub basins selected will be limited by the not-to exceed quantities shown in **Table 2** (Task B6). Sub basins will be selected based on a set of factors that could include:

- Amount of I/I determined in Task B3 (Sub Basin I/I ranking)
- Shallow sewer pipes at a greater risk of sanitary sewer overflows, etc.
- Available capacity of the gravity lines

GIS mapping will be created to show the selected sub basins.

B5. Workshop – Review Flow Monitoring Results and Proposed SSES Field Activities

Meet with City staff to discuss flow monitoring and rain gauge data. Figures showing the amount of I/I in each flow monitor basin will be presented. The proposed sub basins for SSES field activities will be presented, along with selection criteria, overall field inspection goals and schedule. FNI will provide mapping of the sub basin study area and review access, schedule, and other relevant considerations for field work with City staff. City comments will be solicited and addressed.

B6. SSES Field Activities in Sub Basins

FNI will conduct SSES field activities in the agreed upon sub basins discussed with City staff in Task B4 and B5. SSES field activities shall consist of pipeline CCTV inspection and manhole inspections up to the quantities listed in **Table 2**.

Table 2: Not-To-Exceed Quantities for SSES Field Investigation

SSES Field Activity	Not to Exceed Quantity
Pipeline CCTV	36,000 Linear Feet
Manhole Inspections	120 Manholes

Gravity Line CCTV

FNI will perform cleaning (up to three passes) and conduct CCTV on the selected sanitary sewer lines in the sub basins, up to 36,000 linear feet. The CCTV will be coded for defects and observations according to NASSCO PACP standards. The City will provide the following:

- Access to the sanitary sewer system and any required flow diversion, bypass pumping, and operation of lift stations.
- A site for local disposal of sludge
- A means of providing water such as a mobile meter or fire hydrant hookup

Manhole Inspections

FNI will conduct inspections of the sanitary sewer manholes in the sub basins, up to 120 manholes. The manhole inspections will be coded for defects and observations according to NASSCO MACP standards. The City will provide the following:

- Access to the manholes
- Any required manhole uncovering

B7. Workshop – Review Sub Basin SSES Results

Meet with City staff to review the results from the sub basin SSES field activities.

TASK C: LAND USE ASSUMPTIONS AND WASTEWATER LOAD PROJECTIONS

C1. Develop Land Use Assumptions

FNI will utilize the City's most current planning and development information to develop existing, 5-year, 10-year, and 20-year land use assumptions.

C2. Develop Wastewater Flow Projections

Historical flow data will be analyzed to select a per-capita residential wastewater flow and a non-residential wastewater flow for future flow projections. Wastewater flow projections will be developed by flow monitor basin for the 5-year, 10-year, and 20-year planning periods.

C3. Workshop – Review **Land Use Assumptions and Wastewater Flow Projections**

Meet with City to discuss population and wastewater flow projections. City comments will be solicited and addressed.

TASK D: HYDRAULIC MODEL UPDATE AND CALIBRATION

D1. Update Wastewater Hydraulic Model Network and Connectivity

The City's wastewater collection system hydraulic model is in the Innovyze InfoWorks ICM modeling software. FNI will evaluate the latest available wastewater GIS, as built plans, construction drawings, CAD files, lift station facility dimensions, and pump curve and force main information to update the ICM hydraulic model network. FNI will coordinate with City staff on needed information.

D2. Assign Existing Wastewater Flows to the Hydraulic Model

FNI will geocode water meter billing data and use a return percentage of water usage to assign wastewater flows to the hydraulic model. Major customers will be located and allocated as a point loading. Diurnal curves representing the dry weather wastewater flow patterns will be created for each flow monitor basin and assigned to the hydraulic model.

D3. Dry Weather Calibration

FNI will select a dry weather period from the field collected flow monitoring data during which to perform an extended period simulation (EPS) dry weather calibration. The existing per capita wastewater flows from the water meter billing data will be factored as necessary to match the field collected flow data to within industry standard tolerances. Lift station operational controls and force main parameters will be adjusted to achieve dry weather flow calibration. FNI will prepare calibration plots overlaying the modeled dry weather flows vs. the field collected flow data at each flow monitoring location.

D4. Wet Weather Calibration

FNI will review field collected flow monitor and rain gauge data and select a wet weather calibration storm event. The recorded storm hyetograph will be applied to the hydraulic model to perform a dynamic wet weather calibration. Hydrologic parameters in the model will be adjusted so that the peak wet weather flows generated in the model closely match the observed flows. FNI will prepare calibration plots overlaying the modeled wet weather flows vs. the field collected flow data at each flow monitoring location.

D5. Workshop – Review Hydraulic Model Update and Calibration

Meet with the City to discuss the results of the wastewater hydraulic model update and dry weather and wet weather calibrations. City comments will be solicited and addressed.

TASK E: EXISTING AND FUTURE SYSTEM ANALYSES

E1. Existing Wastewater System Analysis

FNI will utilize a design storm and run the wastewater model and identify locations where the model is predicting existing surcharging, overflows, and/or other capacity or restriction issues. The existing system analysis will include the impacts of lift stations on the existing wastewater system hydraulics under peak wet weather flow conditions. Mapping will be prepared showing the locations of model predicted surcharging and overflows. Each occurrence of modeled gravity line surcharging will be categorized as due to a downstream restriction or a localized pipeline capacity deficiency.

E2. Future Model Scenario Development and Analyses

FNI will create model scenarios for the 5-year, 10-year, and 20-year planning periods. Projected residential and non-residential wastewater loads (Task C2) will be distributed in the hydraulic model. Mapping will be prepared showing the locations of model predicted surcharging and overflows. Each occurrence of modeled gravity line surcharging will be categorized as due to a downstream restriction or a localized pipeline capacity deficiency.

E3. Workshop – Review Existing and Future Wastewater System Analyses

Meet with the City to present and discuss results of the wastewater system analyses. City comments will be solicited and addressed.

TASK F: CAPITAL IMPROVEMENTS PLAN AND SSES IMPROVEMENT RECOMMENDATIONS

F1. Develop Capacity Project Recommendations

The results of the hydraulic modeling will be utilized to develop capacity-based project recommendations for each planning period based on the existing and future projected peak wastewater flows. FNI will produce mapping showing recommended capacity improvements for the 5-year, 10-year, and 20-year planning periods.

F2. Develop Draft Capital Improvements Plan (CIP)

FNI will develop a draft wastewater capital improvements plan (CIP) consisting of project descriptions, justification, phasing, and planning level cost estimates for each proposed project in year 2021 dollars including engineering and contingencies. Large scale city-wide maps will be produced showing proposed capacity CIP project locations.

F3. SSES Improvement Recommendations

FNI will analyze the results of the sub basin SSES field activities (**Task B6**) and provide mapping and/or tabular summary data, as appropriate. Improvement alternatives will be developed with the goal of reducing I/I in the collection system and associated excessive surcharging and potential overflows. Cost estimates will be developed for the improvement alternatives.

F4. Workshop – Review Capacity CIP and SSES Improvement Recommendations

Meet with the City to present and discuss draft capacity CIP and SSES improvement recommendations and associated planning level costs. City comments will be solicited and addressed.

TASK G: WASTEWATER MASTER PLAN REPORT AND SSES TECHNICAL MEMORANDUM

G1. Prepare Draft Wastewater Master Plan Report

FNI will document the wastewater study process, analysis, and draft CIP recommendations in a draft wastewater master plan report with an executive summary and provide an electronic copy for City staff to review.

G2. Prepare Draft SSES Results and Improvement Alternatives Technical Memorandum

FNI will prepare a draft Technical Memorandum (TM) documenting the process, findings, recommendations, and cost estimates developed during the SSES flow monitoring, field investigation, and analysis tasks. FNI will provide an electronic copy of the draft TM for staff to review.

G3. Meeting – Review Draft Wastewater Master Plan Report and SSES TM

Meet with City staff to review the draft wastewater master plan report and SSES TM. FNI will answer any questions and solicit comments from City staff.

G4. Finalize Wastewater Master Plan Report and SSES TM

Revise draft wastewater master plan report and SSES TM to address City comments and submit three (3) copies of the final wastewater master plan report and final SSES TM as well as an electronic PDF version of each.

G5. City Council Presentation on Wastewater Master Plan

FNI will prepare a presentation on the wastewater master plan recommendations and present to City Council. Prior to the council presentation, FNI will provide the draft presentation to City staff for review and incorporate any staff comments.

TASK H: RATE STUDY DATA COLLECTION AND RATE MODEL UPDATE

H1. Rate Study Data Collection

FNI will submit a data request memorandum identifying data needs for the rate study task. This data will include detailed revenue, expenses, bond rating and debt service information, and other operating, financial, management, policy, and ordinance data.

H2. Meeting – Rate Study Task Kickoff

FNI will conduct a meeting with City staff to review the rate study data request memorandum with the City and discuss any additional information that should be included in the rate study. The meeting will include discussion of the rate study and any questions from City staff, including:

- Public perception of current rates and rate adjustments;
- Capital/Operational demand changes anticipated over the study's forecasted period;
- Current bond rating and debt service assumptions;
- Initial rate design pricing objectives; and,
- Initial strategies for implementing/communicating possible rate changes.

H3. Update Water and Wastewater Rate Models

FNI will utilize the information received in the data request as well as subsequent information detailed in Tasks I through K to update the City's rate model.

TASK I: PROJECT OPERATING EXPENSES AND REVENUE

I1. Analyze Historical Expenses and Revenue

FNI will analyze historical trends of expenses and revenue considering historical data including number of connections and customers, metered water sales, wastewater flows, historical water and wastewater rates, etc.

I2. Analyze Historical Expenses and Revenue

FNI will utilize projections for future growth in population (Task C1) and develop future growth water and wastewater connections. Utilizing these projections, FNI will develop future operating expenses and revenue for the water and wastewater funds at current rates over the next five fiscal years. FNI will provide the projected operating expenses and revenue at current rates to City staff for review.

TASK J: DEVELOP REVENUE REQUIREMENTS

J1. Determine Test Year Revenue Requirements

FNI will develop test year revenue requirements for the water and wastewater utility using the cash needs approach.

J2. Develop Estimated Revenue Requirements

FNI will develop a five-year revenue requirement forecast. Water and wastewater capital improvements expenses will be incorporated into the rate models. FNI will work closely with City staff to examine the City's planned method of financing future capital improvements (e.g. cash, debt, grants) and the financing methods' impact on retail rates. FNI will develop an outlook that considers contractual obligations, operating and capital reserve targets, debt coverage requirements, past studies, ordinances, and relevant contracts. This revenue requirement will determine the level of required revenue to fund utility operations, meet target reserve balances, comply with debt service coverage ratios, anticipate operational and/or staffing changes and ensure overall long-term financial sustainability of the utility. The revenue requirement will serve as the basis for the development of the financing plan to meet projected capital improvement expenses.

J3. Meeting – Review Expense/Revenue Projections and Revenue Requirements

FNI will conduct a progress meeting with City staff to review Tasks I and J. FNI will review the projected operating expenses and revenue at current rates and discuss the resulting expense and revenue calculations. Additionally, FNI will review the capital improvement costs and other information leading to the five-year revenue requirement estimates with the City. If necessary, the meeting will include discussion of alternatives to modify rate increases, including reduced operating expenses, changes in timing of capital improvements, other financing sources, and other adjustments.

TASK K: DEVELOP COST OF SERVICE

K1. Cost of Service Analysis

Considering the projected expenses for the water and wastewater utilities, FNI will develop a cost of service assessment by customer class, including customers outside of the City limits. This cost of service will consider the demand on the utility in terms of daily operations, peak day demands, and peak hour demands. The use

of AWWA standard processes ensures that costs will be allocated to each water customer class based on the proportionate demands they impose on the water utility system. To the extent the City would like to consider additional customer classes, it will need to be determined if consumption data is available for the new class. The new class will then be included in the cost of service analysis.

TASK L: DEVELOP RATE STRUCTURES AND RATE STUDY REPORT

L1. Develop Water and Wastewater Rate Structures

FNI will develop up to two water and wastewater rate design alternatives that meet the City's pricing goals and objectives. The rate structures will be reflective of industry accepted practices and procedures and rate regulations within the State of Texas and which balance the recovery of revenue between fixed and variable rates on an equitable basis.

L2. Benchmark Water and Wastewater Rates

FNI will obtain data on water and wastewater rates of nearby communities and compare with existing and proposed City of Alvin rates.

L3. Meeting – Discuss Alternative Rate Structures

FNI will conduct a progress meeting with City staff to review the alternative rate structures and benchmarked rates. FNI will revise the alternative rate structures based on input from City staff.

L4. Prepare Draft Rate Study Report

FNI will prepare a draft rate study report and provide an electronic PDF copy to City staff Project Manager for review. The draft report will discuss the rate study process and summarize findings and rate structure alternatives for water and wastewater rates.

L5. City Council Presentation on Rate Study

FNI will prepare a presentation on the results of the rate study, including recommended rates, and present to City Council. Prior to the council presentation, FNI will provide the draft presentation to City staff for review and incorporate any staff comments.

L6. Submit Final Rate Study Report

FNI will incorporate the City's comments on the draft rate study report into the Final Rate Study Report and submit an electronic PDF copy and three (3) hard copies.

Summary of Deliverables

- Draft Wastewater Master Plan Report
- Draft SSES Results and Improvement Alternatives Technical Memorandum
- Final Wastewater Master Plan Report
- Final SSES Results and Improvement Alternatives Technical Memorandum
- Draft Rate Study Report
- Final Rate Study Report

Summary of Meetings, Workshops, and Presentations

- Project Kickoff Meeting
- Workshop: Review Flow Monitoring Results and Proposed SSES Field Activities
- Workshop: Review Sub Basin SSES Results
- Workshop: Review Land Use Assumptions and Wastewater Flow Projections
- Workshop: Review Hydraulic Model Update and Calibration
- Workshop: Review Existing and Future Wastewater System Analyses
- Workshop: Review capacity CIP and SSES Improvement Recommendations
- Meeting: Review Draft Wastewater Master Plan Report and SSES TM
- City Council Presentation on Wastewater Master Plan
- Meeting: Rate Study Task Kickoff
- Meeting: Review Expense/Revenue Projections and Revenue Requirements
- Meeting: Discuss Alternative Rate Structures
- City Council Presentation on Water and Wastewater Rate Study

ARTICLE II

SPECIAL SERVICES: FNI shall render the following professional services, which are not included in the Basic Services described above, in connection with the development of the Project: N/A

ARTICLE III

ADDITIONAL SERVICES: Any services performed by FNI that are not included in the Basic Services or Special Services described above are Additional Services, including:

- Extension of temporary flow monitoring and rain gauge data collection beyond 45 days
- Surveying/GPS shots of manhole rim and invert elevations

ARTICLE IV

TIME OF COMPLETION: FNI is authorized to commence work on the Project upon execution of this Agreement and agrees to complete the services according to the following schedule:

- Population and Wastewater Flow Projections: 120 days after Notice to Proceed
- Draft Wastewater Master Plan Report and SSES TM: 390 days after Notice to Proceed
- Final Wastewater Master Plan Report and SSES TM: 15 days after receiving City comments
- Draft Rate Study Report: 510 days after Notice to Proceed
- Final Rate Study Report: 15 days after receiving City comments

If FNI's services are delayed through no fault of FNI, FNI shall be entitled to adjust contract schedule consistent with the number of days of delay. These delays may include but are not limited to delays in Client or regulatory reviews, delays on the flow of information to be provided to FNI, governmental approvals, etc. These delays may result in an adjustment to compensation as outlined on the face of this Agreement and in Attachment CO.

ARTICLE V

RESPONSIBILITIES OF CLIENT: Client shall perform the following in a timely manner so as not to delay the services of FNI:

A. Designate in writing a person to act as Client's representative with respect to the services to be rendered under this Agreement. Such person shall have contract authority to transmit instructions, receive information, interpret and define Client's policies and decisions with respect to FNI's services for the Project.

B. Provide all criteria and full information as to Client's requirements for the Project, including design objectives and constraints, space, capacity and performance requirements, flexibility and expandability, and any budgetary limitations; and furnish copies of all design and construction standards which Client will require to be included in the drawings and specifications.

C. Assist FNI by placing at FNI's disposal all available information pertinent to the Project including previous reports and any other data relative to design or construction of the Project.

D. Arrange for access to and make all provisions for FNI to enter upon public and private property as required for FNI to perform services under this Agreement.

E. Examine all studies, reports, sketches, drawings, specifications, proposals and other documents presented by FNI, obtain advice of an attorney, insurance counselor and other consultants as Client deems appropriate for such examination and render in writing decisions pertaining thereto within a reasonable time so as not to delay, or cause rework in, the services of FNI.

F. Furnish approvals and permits from all governmental authorities having jurisdiction over the Project and such approvals and consents from others as may be necessary for completion of the Project.

G. Provide such accounting, independent cost estimating and insurance counseling services as may be required for the Project, such legal services as Client may require or FNI may reasonably request with regard to legal issues pertaining to the Project including any that may be raised by Contractor(s), such auditing service as Client may require to ascertain how or for what purpose any Contractor has used the moneys paid under the construction contract, and such inspection services as Client may require to ascertain that Contractor(s) are complying with any law, rule, regulation, ordinance, code or order applicable to their furnishing and performing the work.

H. Give prompt written notice to FNI whenever Client observes or otherwise becomes aware of any development that affects the scope or timing of FNI's services, or any defect or nonconformance of the work of any Contractor.

I. Furnish, or direct FNI to provide, Additional Services as stipulated in Attachment SC, Article III of this Agreement or other services as required.

J. Bear all costs incident to compliance with the requirements of this Article V.

ARTICLE VI

DESIGNATED REPRESENTATIVES: FNI and Client designate the following representatives:

Client's Designated Representative – Michelle Segovia, PE, CFM
1100 W. Highway 6
Alvin, TX 77511
(281) 388-4341
msegovia@cityofalvin.com

Client's Accounting Representative – Michael Higgins
216 W. Sealy Street
Alvin, TX 77512
(281) 388-4216
mhiggins@cityofalvin.com

FNI's Designated Representative – Kendall Ryan, PE
11200 Broadway St., Suite 2320
Pearland, Texas 77584
832-456-4732
Kendall.ryan@freese.com

FNI's Accounting Representative – Jana Collier
4055 International Plaza, Suite 200
Fort Worth, TX 76109
817-735-7354
JVC@freese.com

TERMS AND CONDITIONS OF AGREEMENT

1. **DEFINITIONS:** The term Client as used herein refers to the City of Alvin. The term FNI as used herein refers to Freese and Nichols, Inc., its employees and agents; also its subcontractors and their employees and agents. As used herein, Services refers to the professional services performed by Freese and Nichols pursuant to the Agreement.

2. **CHANGES:** Client, without invalidating the Agreement, may order changes within the general scope of the work required by the Agreement by altering, adding to and/or deducting from the work to be performed. If any change under this clause causes an increase or decrease in FNI's cost of, or the time required for, the performance of any part of the Services under the Agreement, an equitable adjustment will be made by mutual agreement and the Agreement modified in writing accordingly.

3. **TERMINATION:** The obligation to provide services under this Agreement may be terminated by either party upon ten days' written notice. In the event of termination, FNI will be paid for all services rendered and reimbursable expenses incurred to the date of termination and, in addition, all reimbursable expenses directly attributable to termination.

4. **CONSEQUENTIAL DAMAGES:** In no event shall FNI or its subcontractors be liable in contract, tort, strict liability, warranty, or otherwise for any special, indirect, incidental or consequential damages, such as loss of product, loss of use of the equipment or system, loss of anticipated profits or revenue, non-operation or increased expense of operation or other equipment or systems.

5. **INFORMATION FURNISHED BY CLIENT:** Client will assist FNI by placing at FNI's disposal all available information pertinent to the Project including previous reports and any other data relative to design or construction of the Project. FNI shall have no liability for defects or negligence in the Services attributable to FNI's reliance upon or use of data, design criteria, drawings, specifications or other information furnished by Client and Client agrees to indemnify and hold FNI harmless from any and all claims and judgments, and all losses, costs and expenses arising therefrom. FNI shall disclose to Client, prior to use thereof, defects or omissions in the data, design criteria, drawings, specifications or other information furnished by Client to FNI that FNI may reasonably discover in its review and inspection thereof.

6. **INSURANCE:** FNI shall provide to Client certificates of insurance which shall contain the following minimum coverage:

Commercial General Liability		**Workers' Compensation**	
General Aggregate	$2,000,000	As required by Statute	
Automobile Liability (Any Auto)		**Professional Liability**	
CSL	$1,000,000	$3,000,000 Annual Aggregate	

7. **SUBCONTRACTS:** If, for any reason, at any time during the progress of providing Services, Client determines that any subcontractor for FNI is incompetent or undesirable, Client will notify FNI accordingly and FNI shall take immediate steps for cancellation of such subcontract. Subletting by subcontractors shall be subject to the same regulations. Nothing contained in the Agreement shall create any contractual relation between any subcontractor and Client.

8. **OWNERSHIP OF DOCUMENTS:** All drawings, reports data and other project information developed in the execution of the Services provided under this Agreement shall be the property of the Client upon payment of FNI's fees for services. FNI may retain copies for record purposes. Client agrees such documents are not intended or represented to be suitable for reuse by Client or others. Any reuse by Client or by those who obtained said documents from Client without written verification or adaptation by FNI will be at Client's sole risk and without liability or legal exposure to FNI, or to FNI's independent associates or consultants, and Client shall indemnify and hold harmless FNI and FNI's independent associates and consultants from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom. Any such verification or adaptation will entitle FNI to further reasonable compensation. FNI may reuse all drawings, report data and other project information in the execution of the Services provided under this Agreement in FNI's other activities. Any reuse by FNI will be at FNI's sole risk and without liability or legal exposure to Client, and FNI shall indemnify and hold harmless Client from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom.

FNI RW
CLIENT_____

9. **POLLUTANTS AND HAZARDOUS WASTES:** It is understood and agreed that FNI has neither created nor contributed to the creation or existence of any hazardous, radioactive, toxic, irritant, pollutant, or otherwise dangerous substance or condition at the site, if any, and its compensation hereunder is in no way commensurate with the potential risk of injury or loss that may be caused by exposures to such substances or conditions. The parties agree that in performing the Services required by this Agreement, FNI does not take possession or control of the subject site, but acts as an invitee in performing the services, and is not therefore responsible for the existence of any pollutant present on or migrating from the site. Further, FNI shall have no responsibility for any pollutant during clean-up, transportation, storage or disposal activities.

10. **OPINION OF PROBABLE COSTS:** FNI will furnish an opinion of probable project development cost based on present day cost, but does not guarantee the accuracy of such estimates. Opinions of probable cost, financial evaluations, feasibility studies, economic analyses of alternate solutions and utilitarian considerations of operations and maintenance costs prepared by FNI hereunder will be made on the basis of FNI's experience and qualifications and represent FNI's judgment as an experienced and qualified design professional. It is recognized, however, that FNI does not have control over the cost of labor, material, equipment or services furnished by others or over market conditions or contractors' methods of determining their prices.

11. **CONSTRUCTION REPRESENTATION:** If required by the Agreement, FNI will furnish Construction Representation according to the defined scope for these services. FNI will observe the progress and the quality of work to determine in general if the work is proceeding in accordance with the Contract Documents. In performing these services, FNI will endeavor to protect Client against defects and deficiencies in the work of Contractors; FNI will report any observed deficiencies to Client, however, it is understood that FNI does not guarantee the Contractor's performance, nor is FNI responsible for the supervision of the Contractor's operation and employees. FNI shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by the Contractor, or the safety precautions and programs incident to the work of the Contractor. FNI shall not be responsible for the acts or omissions of any person (except his own employees or agent) at the Project site or otherwise performing any of the work of the Project. If Client designates a person to serve in the capacity of Resident Project Representative who is not a FNI's employee or FNI's agent, the duties, responsibilities and limitations of authority of such Resident Project Representative(s) will be set forth in writing and made a part of this Agreement before the Construction Phase of the Project begins.

12. **PAYMENT:** Progress payments may be requested by FNI based on the amount of services completed. Payment for the services of FNI shall be due and payable upon submission of a statement for services to CLIENT and in acceptance of the services as satisfactory by the CLIENT. Statements for services shall not be submitted more frequently than monthly. Any applicable new taxes imposed upon services, expenses, and charges by any governmental body after the execution of this Agreement will be added to FNI's compensation.

    If CLIENT fails to make any payment due FNI for services and expenses within thirty (30) days after receipt of FNI's statement for services therefore, the amounts due FNI will be increased at the rate of one percent (1%) per month from said thirtieth (30th) day, and, in addition, FNI may, after giving seven (7) days' written notice to CLIENT, suspend services under this Agreement until FNI has been paid in full, all amounts due for services, expenses and charges.

13. **ARBITRATION:** No arbitration arising out of, or relating to, this Agreement involving one party to this Agreement may include the other party to this Agreement without their approval.

14. **SUCCESSORS AND ASSIGNMENTS:** CLIENT and FNI each are hereby bound and the partners, successors, executors, administrators and legal representatives of CLIENT and FNI are hereby bound to the other party to this Agreement and to the partners, successors, executors, administrators and legal representatives (and said assigns) of such other party, in respect of all covenants, agreements and obligations of this Agreement.

    Neither CLIENT nor FNI shall assign, sublet or transfer any rights under or interest in (including, but without limitation, moneys that may become due or moneys that are due) this Agreement without the written consent of the other, except to the extent that any assignment, subletting or transfer is mandated by law or the effect of this limitation may be restricted by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement. Nothing contained in this paragraph shall prevent FNI from employing such independent associates and consultants as FNI may deem appropriate to assist in the performance of services hereunder.

15. **PURCHASE ORDERS:** If a Purchase Order is used to authorize FNI's Services, only the terms, conditions/instructions typed on the face of the Purchase Order shall apply to this Agreement. Should there be any conflict between the Purchase Order and the terms of this Agreement, then this Agreement shall prevail and shall be determinative of the conflict.

FNI RW
CLIENT_____

Agenda Commentary

Meeting Date: 1/7/2021

Department: Engineering **Contact:** Michelle Segovia, City Engineer

Agenda Item: Consider an Engineering Services Agreement with Freese and Nichols, Inc. in an amount not to exceed $59,914 for engineering design services for the Alvin Wastewater Treatment Plant Facility Plan; and authorize the City Manager to sign the Agreement upon legal review.

Type of Item: ☐Ordinance ☐Resolution ☒Contract/Agreement ☐Public Hearing ☐Plat ☐Discussion & Direction ☐Other

Summary: The Engineering Services Agreement being considered will provide an evaluation of the City's Wastewater Treatment Plant (WWTP) and development of a facility plan that will identify improvements that will be required at the plant in the 5-year, 10-year, and 20-year planning periods. It is proposed that design services will culminate in a technical memorandum detailing the results of the plant evaluation and include a phased capital improvements plan for the plant. This evaluation will use wastewater flow projections from the Wastewater Master Plan Update which is currently being proposed and is therefore time dependent on that plan.

Staff recommends approval of this Agreement.

Funding Expected: Revenue ☐ Expenditure ☒ N/A ☐ **Budgeted Item:** Yes ☒ No ☐ N/A ☐

Funding Account: 220-6003-00-9006 **Amount:** $59,914 **1295 Form Required?** Yes ☒ No ☐

Legal Review Required: N/A ☐ Required ☒ **Date Completed:** 12/30/2020 SLH

Supporting documents attached:

- Freese Proposal for the Alvin WWTP Facility Plan

Recommendation: Move to approve an Engineering Services Agreement with Freese and Nichols, Inc. in an amount not to exceed $59,914 for engineering design services for the Alvin Wastewater Treatment Plant Facility Plan; and authorize the City Manager to sign the Agreement upon legal review.

Reviewed by Department Head, if applicable ☒
Reviewed by City Attorney, if applicable ☒
Reviewed by Chief Financial Officer, if applicable ☒
Reviewed by City Manager ☒

FREESE AND NICHOLS
Innovative approaches
Practical results
Outstanding service
11200 Broadway Street, Suite 2320 • Pearland, Texas 77584 • 832-456-4700 • FAX 817-735-7491 www.freese.com

January 7, 2021

Michelle H. Segovia, P.E., CFM
City Engineer
City of Alvin
1100 W. Highway 6
Alvin, Texas 77511

Re: PSA for Alvin WWTP Facility Plan

Dear Ms. Segovia:

Freese and Nichols, Inc. (FNI) is pleased to provide you with the attached professional services agreement for the Alvin WWTP Facility Plan. The scope of work includes an evaluation of the Alvin WWTP and development of a facility plan that will identify improvements needed at the Alvin WWTP phased over 5-year, 10-year, and 20-year planning periods. FNI proposes to conduct the attached scope of services for a lump sum fee of **$59,914**.

We are looking forward to the opportunity to work with the City of Alvin on this project.

Sincerely,

Freese and Nichols, Inc.

Murali Erat, P.E.
Project Manager
(832) 456-4709
Murali.Erat@freese.com

CC: Jared Barber, P.E., Richard Weatherly, P.E., David Munn, P.E.

Rev. 4/19

PROFESSIONAL SERVICES AGREEMENT

STATE OF TEXAS §

COUNTY OF TARRANT §

This Agreement is entered into by **City of Alvin**, **TX**, hereinafter called "Client" and Freese and Nichols, Inc., hereinafter called "FNI." In consideration of the Agreements herein, the parties agree as follows:

I. **EMPLOYMENT OF FNI:** In accordance with the terms of this Agreement, Client agrees to employ and compensate FNI to perform professional services in connection with the Project. The Project is described as **Alvin WWTP Facility Plan**.

II. **SCOPE OF SERVICES:** FNI shall render professional services in connection with Project as set forth in Attachment SC – Scope of Services and Responsibilities of Client which is attached to and made a part of this Agreement.

III. **COMPENSATION:** Client agrees to pay FNI for all professional services rendered under this Agreement. FNI shall perform professional services as outlined in the "Scope of Services" for a lump sum fee of **Fifty-Nine Thousand Nine Hundred and Fourteen Dollars, $59,914**.

If FNI's services are delayed or suspended by Client, or if FNI's services are extended for more than 60 days through no fault of FNI, FNI shall be entitled to equitable adjustment of rates and amounts of compensation to reflect reasonable costs incurred by FNI in connection with such delay or suspension and reactivation and the fact that the time for performance under this Agreement has been revised.

IV. **TERMS AND CONDITIONS OF AGREEMENT:** The Terms and Conditions of Agreement as set forth as Attachment TC – Terms and Conditions of Agreement shall govern the relationship between the Client and FNI.

Nothing under this Agreement shall be construed to give any rights or benefits in this Agreement to anyone other than Client and FNI, and all duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of Client and FNI and not for the benefit of any other party.

This Agreement constitutes the entire Agreement between Client and FNI and supersedes all prior written or oral understandings.

This contract is executed in two counterparts. IN TESTIMONY HEREOF, Agreement executed:

Freese and Nichols, Inc.

By: Richard Weatherly

Richard Weatherly, PE
Print Name and Title

Date: January 4, 2021

ATTEST: Stephanie Stephenson

City of Alvin

By: _____

_____
Print Name and Title

Date: _____

ATTEST: _____

SCOPE OF SERVICES AND RESPONSIBILITIES OF CLIENT

PROJECT UNDERSTANDING

The City of Alvin (City) owns and operates a wastewater treatment plant (WWTP) permitted for an average daily flow of 5.0 million gallons per day (MGD) and a 2-hour peak flow of 15 MGD. The City intends to develop a facility plan that will identify improvements required at the WWTP over 5-year, 10-year, and 20-year planning periods, including immediate critical needs to address existing deficiencies. The City also intends to update the wastewater system master plan originally developed in 2015. The wastewater master plan update will provide the timeline and capacity for future expansions expected for the Alvin WWTP.

This scope of work is for the engineering services to develop the facility plan for the Alvin WWTP. As part of the facility plan, Freese and Nichols, Inc. (FNI) will perform an evaluation of the plant to identify the current and future needs; and develop a phased capital improvements plan for the Alvin WWTP, including improvements needed for the future expansions.

ARTICLE I

BASIC SERVICES: FNI shall render the following professional services in connection with the development of the Project:

A. PROJECT MANAGEMENT

1. Conduct Internal Kickoff Meeting – FNI will conduct an internal meeting to outline the project scope, schedule, budget, and make initial task assignments.

2. Conduct Project Kickoff Meeting with the City – FNI will conduct a project kickoff meeting to review the scope of services, schedule, and other project set up items.

3. Conduct one (1) site visit to the Alvin WWTP to generally observe the condition of the facilities and to interview the plant staff.

4. Conduct Progress Meetings with the City – FNI will conduct up to three (3) progress meetings to discuss:
   a. Progress Meeting #1: **Task 1** – Alvin WWTP evaluation results
   b. Progress Meeting #2: **Task 2** – Draft Capital Improvements Plan recommendations
   c. Progress Meeting #3: Review comments on draft Facility Plan Technical Memorandum

5. Provide One-Page Monthly Reports – FNI will prepare and submit monthly status reports to the City with FNI's monthly invoice. Monthly status reports will comprise a one page summary of the progress to date on the project, work completed during the prior month, work anticipated to be completed during the upcoming month, and discussion of any scope, schedule, or budget issues that may need to be resolved.

6. Quality Assurance/Quality Control – FNI will prepare a QA/QC plan including regularly scheduled reviews of project deliverables

B. WWTP FACILITY PLAN

1. Task 1: Evaluation of Alvin WWTP

a. Obtain wastewater flow projections for 5-year, 10-year, and 20-year conditions from the City's wastewater master plan update.

b. Determine the current and projected influent wastewater characteristics (BOD5, TSS, NH3-N). Review historical wastewater influent characteristics and trends to identify average and maximum month loading conditions. Determine design influent loadings based on statistical analysis of historical data in accordance with TCEQ requirements in Chapter 217 – Design Criteria for Domestic Wastewater Systems.

c. Evaluate the hydraulic capacity of the existing unit processes based on available drawings, O&M manuals, and other information provided by the City.

d. Determine capacity available with the existing treatment units at the plant based on the design influent loadings, hydraulics and design criteria specified in TCEQ Chapter 217. Determine the potential for uprating and identify process bottlenecks.

a. Estimate the remaining useful life of each major process (i.e. headworks, clarifiers, biosolids, etc.) based upon the overall observed condition, construction date, and prior rehabilitation date(s). Determine the general time frame for rehabilitation and replacement within the next 5-year, 10-year, and 20-year periods. Results will be provided in a summary table. Risk based condition assessment of individual assets, material testing and physical testing can be provided as an additional service.

2. Task 2: Capital Improvements Program (CIP) for Alvin WWTP

a. Based on the results of the capacity evaluation and a general consideration of the facilities' remaining useful life, identify improvements needed at the Alvin WWTP.

b. Develop the associated AACE Level 5 opinion of probable construction cost for the recommended improvements.

c. Evaluate up to two (2) alternatives to meet future capacity needs determined by the wastewater master plan update. Alternatives will be conceptual level and include expansion of the existing Alvin WWTP and building a new WWTP. Each alternative will include one conceptual layout.

d. Provide phasing of the recommended improvements and develop a schedule through a comprehensive Capital Improvements Program (CIP) to implement the expansion of the treatment components. General consideration will be given to the remaining useful life of the unit processes and need for future rehabilitation and replacement. The CIP will recommend improvements at the plant over 5, 10, and 20 years planning period.

e. Develop and submit a Draft Technical Memorandum (TM) to the City (3 hard copies and 1 electronic copy) documenting the results of the plant evaluation and recommended CIP plan.

f. Address comments from the City and submit a Final TM to the City (3 hard copies and 1 electronic copy).

ARTICLE II

SPECIAL SERVICES: FNI shall render the following professional services, which are not included in the Basic Services described above, in connection with the development of the Project: N/A

ARTICLE III

ADDITIONAL SERVICES: Additional Services to be performed by FNI, if authorized by Client, which are not included in the above described basic services, are described as follows:

A. Providing renderings, model, and mock-ups requested by the Client.

B. Preparing applications and supporting documents for government grants, loans, or planning advances and providing data for detailed applications.

C. Conducting pilot plant studies or tests.

D. Design, contract modifications, studies or analysis required to comply with local, State, Federal or other regulatory agencies that become effective after the date of this agreement.

E. Visits to the site in excess of the number of trips included in Article I for periodic site visits, coordination meetings, or contract completion activities.

F. Providing basic or additional services on an accelerated time schedule. The scope of this service includes cost for overtime wages of employees and consultants, inefficiencies in work sequence and plotting or reproduction costs directly attributable to an accelerated time schedule directed by the Client.

G. Preparing statements for invoicing or other documentation for billing other than for the standard invoice for services attached to this professional services agreement.

ARTICLE IV

TIME OF COMPLETION: FNI is authorized to commence work on the Project upon execution of this Agreement and agrees to complete the services in accordance with the following schedule:

- Kick-off meeting and site visit – 15 days from Notice to Proceed (NTP)
- WWTP Evaluation (Task 1) – 60 days from NTP
- Draft CIP Plan (Task 2) – 60 days from receiving final wastewater flow projections
- Draft Facility Plan TM – 30 days from meeting with City to discuss draft CIP plan (Progress Meeting #2)
- Final Facility Plan TM – 30 days from receiving comments from City on draft TM

If FNI's services are delayed through no fault of FNI, FNI shall be entitled to adjust contract schedule consistent with the number of days of delay. These delays may include but are not limited to delays in Client or regulatory reviews, delays on the flow of information to be provided to FNI, governmental approvals, etc. These delays may result in an adjustment to compensation as outlined on the face of this Agreement.

ARTICLE V

RESPONSIBILITIES OF CLIENT: Client shall perform the following in a timely manner so as not to delay the services of FNI:

A. Provide plant data including Discharge Monitoring Reports (DMRs), influent sampling results, and other plant operational data.

B. Record drawings and project manual of past improvements projects at the plant.

C. Designate in writing a person to act as Client's representative with respect to the services to be rendered under this Agreement. Such person shall have contract authority to transmit instructions, receive information, interpret and define Client's policies and decisions with respect to FNI's services for the Project.

D. Provide all criteria and full information as to Client's requirements for the Project, including design objectives and constraints, space, capacity and performance requirements, flexibility and expandability, and any budgetary limitations.

E. Assist FNI by placing at FNI's disposal all available information pertinent to the Project including previous reports and any other data relative to design or construction of the Project.

F. Arrange for access to and make all provisions for FNI to enter upon public and private property as required for FNI to perform services under this Agreement.

G. Examine all studies, reports, sketches, proposals and other documents presented by FNI, obtain advice of an attorney, insurance counselor and other consultants as Client deems appropriate for such examination and render in writing decisions pertaining thereto within a reasonable time so as not to delay, or cause rework in, the services of FNI.

H. Give prompt written notice to FNI whenever Client observes or otherwise becomes aware of any development that affects the scope or timing of FNI's services.

I. Bear all costs incident to compliance with the requirements of this Article V.

ARTICLE VI

DESIGNATED REPRESENTATIVES: FNI and Client designate the following representatives:

Client's Designated Representative – Michelle Segovia, P.E., CFM
1100 W. Highway 6
Alvin, TX 77511
(281) 388-4341
msegovia@cityofalvin.com

Client's Accounting Representative – Michael Higgins
216 W. Sealy Street
Alvin, TX 77512
(281) 388-4216
mhiggins@cityofalvin.com

FNI's Designated Representative – Murali Erat, P.E.
11200 Broadway St., Ste 2320
Pearland, TX 77584
(832) 456-4709
Murali.Erat@freese.com

FNI's Accounting Representative – Kristina Isaac
10497 Town and Country Way, Suite 600
Houston, TX 77024
(716) 600-6860
Kristina.Isaac@freese.com

TERMS AND CONDITIONS OF AGREEMENT

1. **DEFINITIONS:** The term Client as used herein refers to the City of Alvin, TX. The term FNI as used herein refers to Freese and Nichols, Inc., its employees and agents, and its subcontractors and their employees and agents. As used herein, Services refers to the professional services performed by FNI pursuant to the Agreement.

2. **CHANGES:** Client, without invalidating the Agreement, may order changes within the general scope of the work required by the Agreement by altering, adding to and/or deducting from the work to be performed. If any change under this clause causes an increase or decrease in FNI's cost of, or the time required for, the performance of any part of the Services, an equitable adjustment will be made by mutual agreement and the Agreement modified in writing accordingly.

3. **TERMINATION:** The obligation to provide Services under this Agreement may be terminated by either party upon 10 days' written notice. In the event of termination, FNI will be paid for all Services rendered and reimbursable expenses incurred to the date of termination and, in addition, all reimbursable expenses directly attributable to termination.

4. **CONSEQUENTIAL DAMAGES:** In no event shall FNI or its subcontractors be liable in contract, tort, strict liability, warranty, or otherwise for any special, indirect, incidental or consequential damages, such as loss of product, loss of use of the equipment or system, loss of anticipated profits or revenue, non-operation or increased expense of operation or other equipment or systems.

5. **INFORMATION FURNISHED BY CLIENT:** Client will assist FNI by placing at FNI's disposal all available information pertinent to the Project including previous reports and any other data relative to design or construction of the Project. FNI shall have no liability for defects or negligence in the Services attributable to FNI's reliance upon or use of data, design criteria, drawings, specifications or other information furnished by Client and Client agrees to indemnify and hold FNI harmless from any and all claims and judgments, and all losses, costs and expenses arising therefrom. FNI shall disclose to Client, prior to use thereof, defects or omissions in the data, design criteria, drawings, specifications or other information furnished by Client to FNI that FNI may reasonably discover in its review and inspection thereof.

6. **INSURANCE:** FNI shall provide Client with certificates of insurance with the following minimum coverage:

Commercial General Liability		**Workers' Compensation**	
General Aggregate	$2,000,000	As required by Statute	
Automobile Liability (Any Auto)		**Professional Liability**	
CSL	$1,000,000	$3,000,000 Annual Aggregate	

7. **SUBCONTRACTS:** If, for any reason and at any time during the progress of providing Services, Client determines that any subcontractor for FNI is incompetent or undesirable, Client will notify FNI accordingly and FNI shall take immediate steps for cancellation of such subcontract. Subletting by subcontractors shall be subject to the same regulations. Nothing contained in the Agreement shall create any contractual relation between any subcontractor and Client.

8. **OWNERSHIP OF DOCUMENTS:** All drawings, reports, data and other project information developed in the execution of the Services provided under this Agreement shall be the property of Client upon payment of FNI's fees for Services. FNI may retain copies for record purposes. Client agrees such documents are not intended or represented to be suitable for reuse by Client or others. Any reuse by Client or by those who obtained said documents from Client without written verification or adaptation by FNI, will be at Client's sole risk and without liability or legal exposure to FNI, or to FNI's independent associates or consultants, and Client shall indemnify and hold harmless FNI and FNI's independent associates and consultants from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom. Any such verification or adaptation will entitle FNI to further reasonable compensation. FNI may reuse all drawings, report data and other project information in the execution of the Services provided under this Agreement in FNI's other activities. Any reuse by FNI will be at FNI's sole risk and without liability or legal exposure to Client, and FNI shall indemnify and hold harmless Client from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom.

9. **POLLUTANTS AND HAZARDOUS WASTES:** It is understood and agreed that FNI has neither created nor contributed to the creation or existence of any hazardous, radioactive, toxic, irritant, pollutant, or otherwise dangerous substance or condition at the site, if any, and its compensation hereunder is in no way commensurate with the potential risk of injury or loss that may be caused by exposures to such substances or conditions. The parties agree that in performing the Services required by this Agreement, FNI does not take possession or control of the subject site, but acts as an invitee in performing the Services, and is not therefore responsible for the existence of any pollutant present on or migrating from

FNI RW
CLIENT _____

the site. Further, FNI shall have no responsibility for any pollutant during clean-up, transportation, storage or disposal activities.

10. **OPINION OF PROBABLE COSTS:** FNI will furnish an opinion of probable project development cost based on present day cost, but does not guarantee the accuracy of such estimates. Opinions of probable cost, financial evaluations, feasibility studies, economic analyses of alternate solutions and utilitarian considerations of operations and maintenance costs prepared by FNI hereunder will be made on the basis of FNI's experience and qualifications and represent FNI's judgment as an experienced and qualified design professional. It is recognized, however, that FNI does not have control over the cost of labor, material, equipment or services furnished by others or over market conditions or contractors' methods of determining their prices.

11. **CONSTRUCTION REPRESENTATION:** If required by the Agreement, FNI will furnish construction representation according to the defined scope for these services. FNI will observe the progress and the quality of work to determine in general if the work is proceeding in accordance with the Contract Documents. In performing these services, FNI will report any observed deficiencies to Client, however, it is understood that FNI does not guarantee the Contractor's performance, nor is FNI responsible for the supervision of the Contractor's operation and employees. FNI shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by the Contractor, or the safety precautions and programs incident to the work of the Contractor. FNI shall not be responsible for the acts or omissions of any person (except its own employees or agents) at the Project site or otherwise performing any of the work of the Project. If Client designates a Resident Project Representative that is not an employee or agent of FNI, the duties, responsibilities and limitations of authority of such Resident Project Representative will be set forth in writing and made a part of this Agreement before the Construction Phase of the Project begins.

12. **GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT:** Client agrees to include provisions in the General Conditions of the Construction Contract that require Contractor to include FNI: (1) as an additional insured and in any waiver of subrogation rights with respect to such liability insurance purchased and maintained by Contractor for the Project (except workers' compensation and professional liability policies); and (2) as an indemnified party in the Contractor's indemnification provisions where the Owner is named as an indemnified party.

13. **PAYMENT:** Progress payments may be requested by FNI based on the amount of Services completed. Payment for the Services of FNI shall be due and payable upon submission of a statement for Services to CLIENT and in acceptance of the Services as satisfactory by the Client. Statements for Services shall not be submitted more frequently than monthly. Any applicable new taxes imposed upon Services, expenses and charges by any governmental body after the execution of this Agreement will be added to FNI's compensation.

    If Client fails to make any payment due FNI for services and expenses within 30 days after receipt of FNI's statement for services therefore, the amounts due FNI will be increased at the rate of 1 percent per month from said 30th day, and, in addition, FNI may, after giving 7 days' written notice to Client, suspend services under this Agreement until FNI has been paid in full, all amounts due for services, expenses and charges.

14. **ARBITRATION:** No arbitration, arising out of or relating to this Agreement, involving one party to this Agreement may include the other party to this Agreement without their approval.

15. **SUCCESSORS AND ASSIGNMENTS:** Client and FNI each are hereby bound and the partners, successors, executors, administrators and legal representatives of Client and FNI are hereby bound to the other party to this Agreement and to the partners, successors, executors, administrators and legal representatives (and said assigns) of such other party, in respect of all covenants, agreements and obligations of this Agreement.

    Neither Client nor FNI shall assign, sublet or transfer any rights under or interest in (including, but without limitation, moneys that may become due or moneys that are due) this Agreement without the written consent of the other, except to the extent that any assignment, subletting or transfer is mandated by law or the effect of this limitation may be restricted by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement. Nothing contained in this paragraph shall prevent FNI from employing such independent associates and consultants as FNI may deem appropriate to assist in the performance of Services hereunder.

16. **PURCHASE ORDERS:** If a Purchase Order is used to authorize FNI's Services, only the terms, conditions/instructions typed on the face of the Purchase Order shall apply to this Agreement. Should there be any conflict between the Purchase Order and the terms of this Agreement, then this Agreement shall prevail and shall be determinative of the conflict.

FNI RW
CLIENT _____

Agenda Commentary

Meeting Date: 1/7/2021

Department: Engineering **Contact:** Michelle Segovia, City Engineer

Agenda Item: Consider Resolution 21-R-01, adopting The City of Alvin 2020 Hazard Mitigation Plan Update; and authorize the Mayor to sign the Plan.

Type of Item: ☐Ordinance ☒Resolution ☐Contract/Agreement ☐Public Hearing ☐Plat ☐Discussion & Direction ☐Other

Summary: On December 17, 2020, the City received the attached letter from the Texas Department of Emergency Management (TDEM) stating that the City of Alvin 2020 Hazard Mitigation Plan Update, which was submitted in October 2020, is "Approvable Pending Adoption," by the City Council.

Jeff Ward and Associates submitted the draft plan to TDEM on October 6, 2020, on the City's behalf, following two public meetings/presentations on July 16, 2020 and September 3, 2020. In accordance with FEMA's requirements, communities must have an approved Hazard Mitigation Action Plan and that plan must be updated every five years in order to be eligible to receive federal disaster grant funds.

Approval of Resolution 21-R-01 will provide for the adoption of The City of Alvin 2020 Hazard Mitigation Plan Update (October 2020), therefore keeping the City in compliance with FEMA's requirement. Staff recommends approval of resolution 21-R-01.

Funding Expected: Revenue ☐ Expenditure ☐ N/A ☒ **Budgeted Item:** Yes ☐ No ☐ N/A ☒

Funding Account:_____ **Amount:** _____ **1295 Form Required?** Yes ☐ No ☒

Legal Review Required: N/A ☐ Required ☒ **Date Completed:** 12/30/2020 SLH

Supporting documents attached:

- Resolution 21-R-01
- The City of Alvin 2020 Hazard Mitigation Plan Update (October 2020)
- Approvable Pending Adoption (APA) Letter from the Texas Department of Emergency Management

Recommendation: Move to approve Resolution 21-R-01, adopting The City of Alvin 2020 Hazard Mitigation Plan Update, and authorize the Mayor to sign the Plan.

Reviewed by Department Head, if applicable ☒
Reviewed by City Attorney, if applicable ☒
Reviewed by Chief Financial Officer, if applicable ☒
Reviewed by City Manager ☒

RESOLUTION 21-R-01

A RESOLUTION BY THE CITY COUNCIL OF THE CITY OF ALVIN, TEXAS, ADOPTING THE CITY OF ALVIN 2020 HAZARD MITIGATION PLAN UPDATE AND AUTHORIZING THE MAYOR TO SIGN.

WHEREAS, the Alvin City Council recognizes the threat that natural hazards pose to people and property within the City of Alvin; and

WHEREAS, the City of Alvin has prepared an updated multi-hazard mitigation plan, hereby known as The City of Alvin 2020 Hazard Mitigation Plan Update (October 2020) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, FEMA requires that communities update their Hazard Mitigation Action Plan every five years in order to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, The City of Alvin 2020 Hazard Mitigation Plan Update (October 2020) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Alvin from the impacts of future hazards and disasters; and

WHEREAS, adoption by the Alvin City Council demonstrates their commitment to hazard mitigation and achieving the goals outlined in The City of Alvin 2020 Hazard Mitigation Plan Update (October 2020).

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ALVIN, TEXAS:

Section 1. That the City Council hereby adopts The City of Alvin 2020 Hazard Mitigation Plan Update (October 2020).

Section 2. That this Resolution shall take effect immediately upon its passage.

PASSED AND APPROVED on this the 7th day of January 2021.

CITY OF ALVIN, TEXAS	ATTEST:
By: _____	By: _____
Paul A. Horn, Mayor	Dixie Roberts, City Secretary

2020

City of Alvin, Texas

In touch with the past...planning for the future.

CITY OF ALVIN 2020 HAZARD MITIGATION PLAN UPDATE

October, 2020

CITY OF ALVIN HAZARD MITIGATION PLAN UPDATE
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SECTION 1 – INTRODUCTION AND ADOPTION

This Plan is an Update

The City of Alvin has participated in Hazard Mitigation Plans since 2006. In 2006 the City of Alvin was a part of the Houston-Galveston Area Council Region Hazard Mitigation Plan which was updated in 2012. After the development, approval, and adoption of the multi-jurisdictional Houston-Galveston Area Council Region Hazard Mitigation Plan mentioned above, City of Alvin determined that the City would be best served to have a stand-alone plan that focuses more specifically on the hazards that impact the jurisdiction and that would more specifically identify City actions to address future City specific risks. The Brazoria County Conservation and Reclamation District #3(C&R#3) also wanted a hazard mitigation plan and decided to create one in 2015 with the City of Alvin because of their similar goals and geographic location. The Plan was approved by the Federal Emergency Management Agency (FEMA) in 2016 and adopted by the City Council in 2016. 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. During the review process, C&R#3 declined to participate in the update. Therefore this plan update is a single jurisdiction plan representing the City of Alvin, Texas only.

The intent of the current, updated Plan, while incorporating much of the first and second 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 Alvin Hazard Mitigation Plan Update was prepared in accordance with the guidelines provided by FEMA and the Texas Division of Emergency Management (TDEM). The original Alvin 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 City Council, was a significant step toward identifying potential hazards that threaten the City, 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 City'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 2015-2020 – 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 City, the people and property exposed to those hazards, the planning process, how hazards are recognized in the City'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 Alvin. Since the last Plan update, the City 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.

The original Plan acknowledged that many buildings in the City were built before a nationwide effort was undertaken to map floodplains across the majority of the United States, or the widespread availability of Flood Insurance Rate Maps (FIRMs). Current regulations require new development to recognize reasonably anticipated flood hazards. Older buildings, then, may reasonably be expected to sustain more property damage than new buildings. This remains unchanged for the Plan update, recognizing that older buildings will most likely continue to be more susceptible to flooding than new construction due to floodplain regulations. The City must carefully balance development in hazard-prone areas with the tremendous growth in population both residential and commercial.

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

- This plan update only includes the City of Alvin.
- Hazards that were profiled in the last plan have been omitted from this plan with explanations.
- The goal has been streamlined from earlier versions.
- The sections have been reduced from nine to five – however, the content from the four sections in the last plan have been merged into this Plan's five sections.
- Recognizing the importance of external stakeholder and public review and understanding of the hazard mitigation plan, the City did more outreach to solicit these two important group's views and expertise.
- Since 2015, the City has annexed approximately 1 square mile around the 2015 City limits. In addition the current Extra Territorial Jurisdiction (ETJ) into the City and is now one square mile around the 2018 annexation of ETJ. The HMP has been updated to reflect this expansion.

Adoption by City Council

The City of Alvin advised the City Council 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, the City will formally adopt the Plan and will include the Council's formal resolution.

COUNCIL RESOLUTION

Community Profile

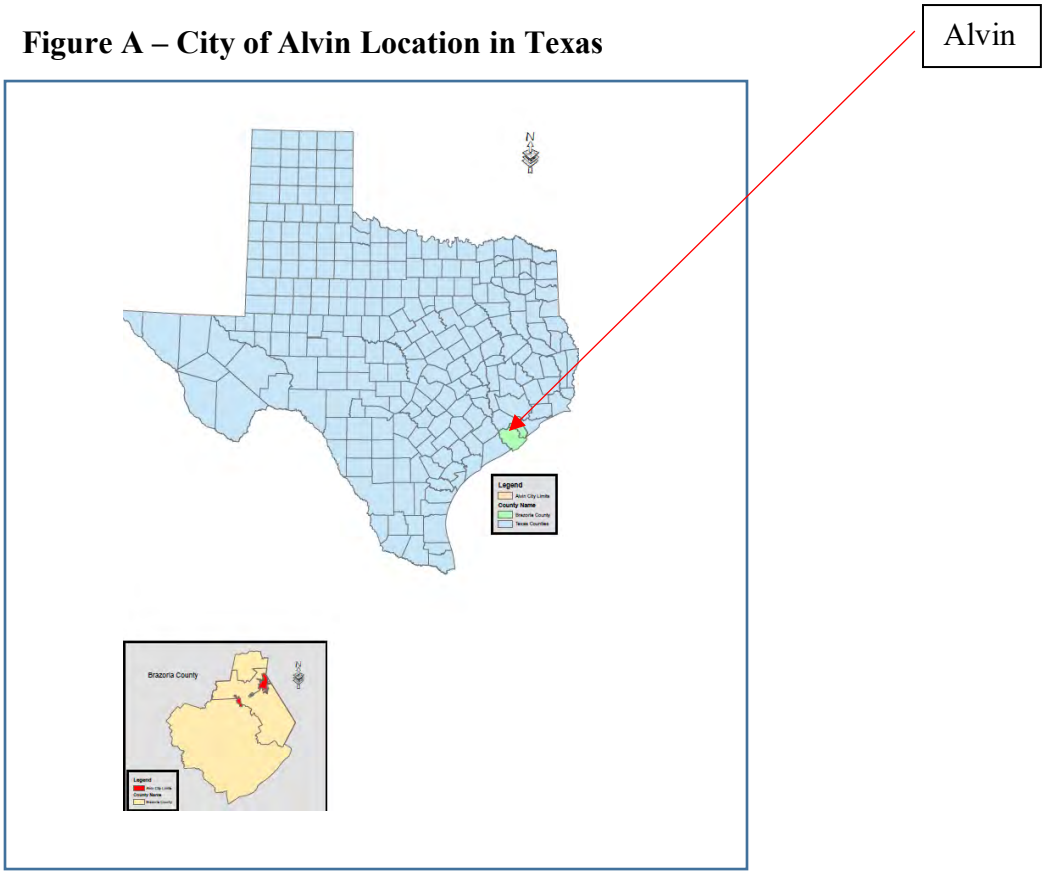
Planning Area

The City of Alvin is an urban/rural Community that comprises 23 square miles of level to slightly rolling terrain with an elevation ranging from approximately 30 to as high as 50 feet above sea level. It is located at 29°23' north latitude and 95°16' west longitude, is approximately twenty-four miles south-southwest of Houston, at the northeast end of Brazoria County. The Dickenson and Mustang Bayous flow through and effect the City of Alvin. Figure A depicts Alvin's location within the State of Texas.

The City of Alvin is located in Brazoria County and is bordered by Harris County to the north, Fort Bend County to the west, Matagorda County to the south and west, Galveston County to the east, and the Gulf of Mexico to the south.

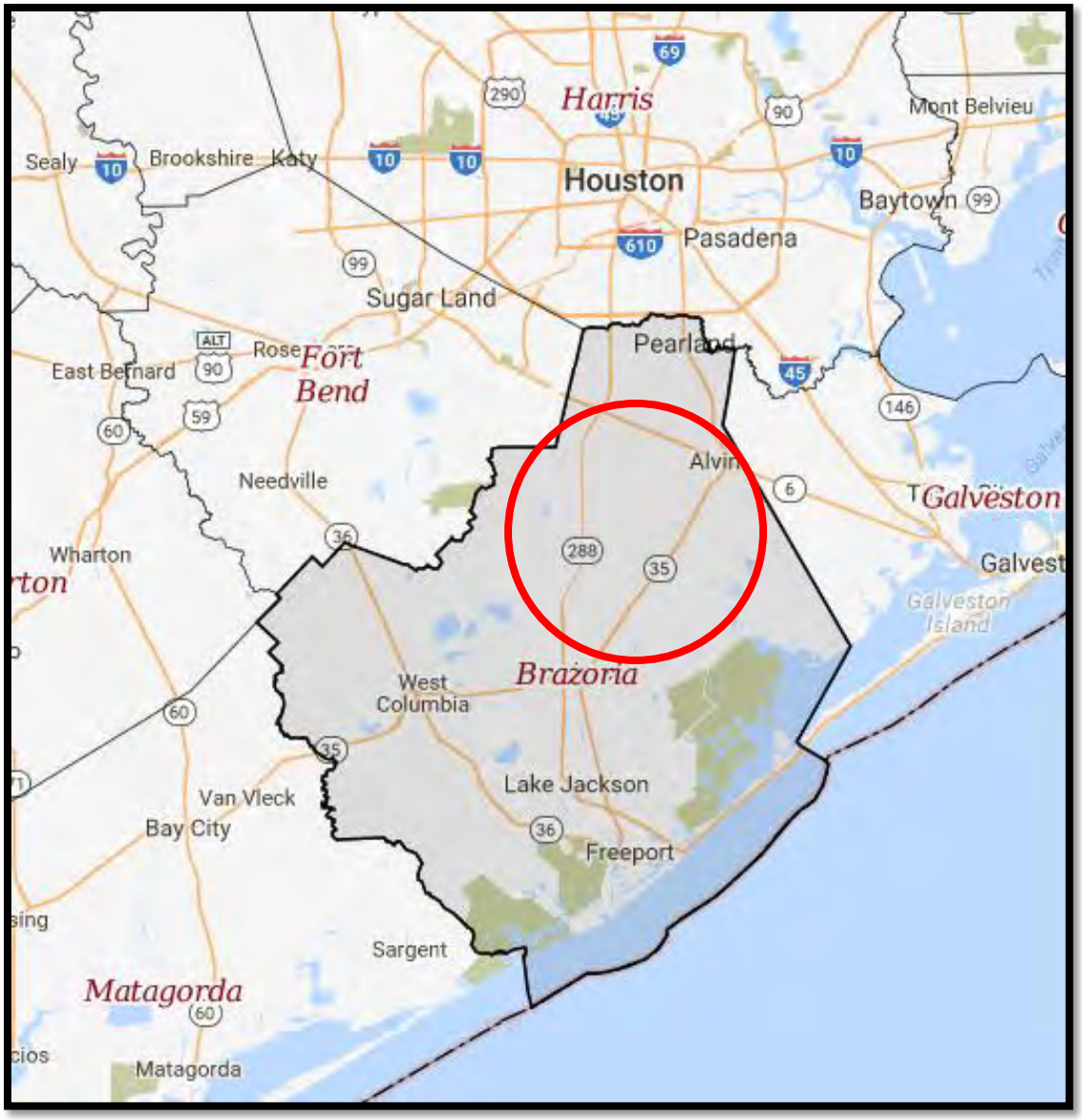
Alvin is located at the "crossroads" of State Highway (S.H.) 35 and S.H. 6 in the Texas Gulf region. It is situated approximately 27 miles northwest of Galveston Island, and abuts the neighboring communities of League City, Friendswood, Pearland, Manvel and Bonney. Primary access to the community is via S.H. 35, which extends north through Pearland (known locally as Main Street) past the Sam Houston Tollway/Beltway 8 terminating at Interstate Highway (I.H.) 45. To the south S.H. 35 passes through Angleton. Another primary access is S.H. 6 which stretches from I.H. 45/Gulf Freeway north of Galveston through Alvin on a northwest alignment through Sugar Land.

Figure A – City of Alvin Location in Texas



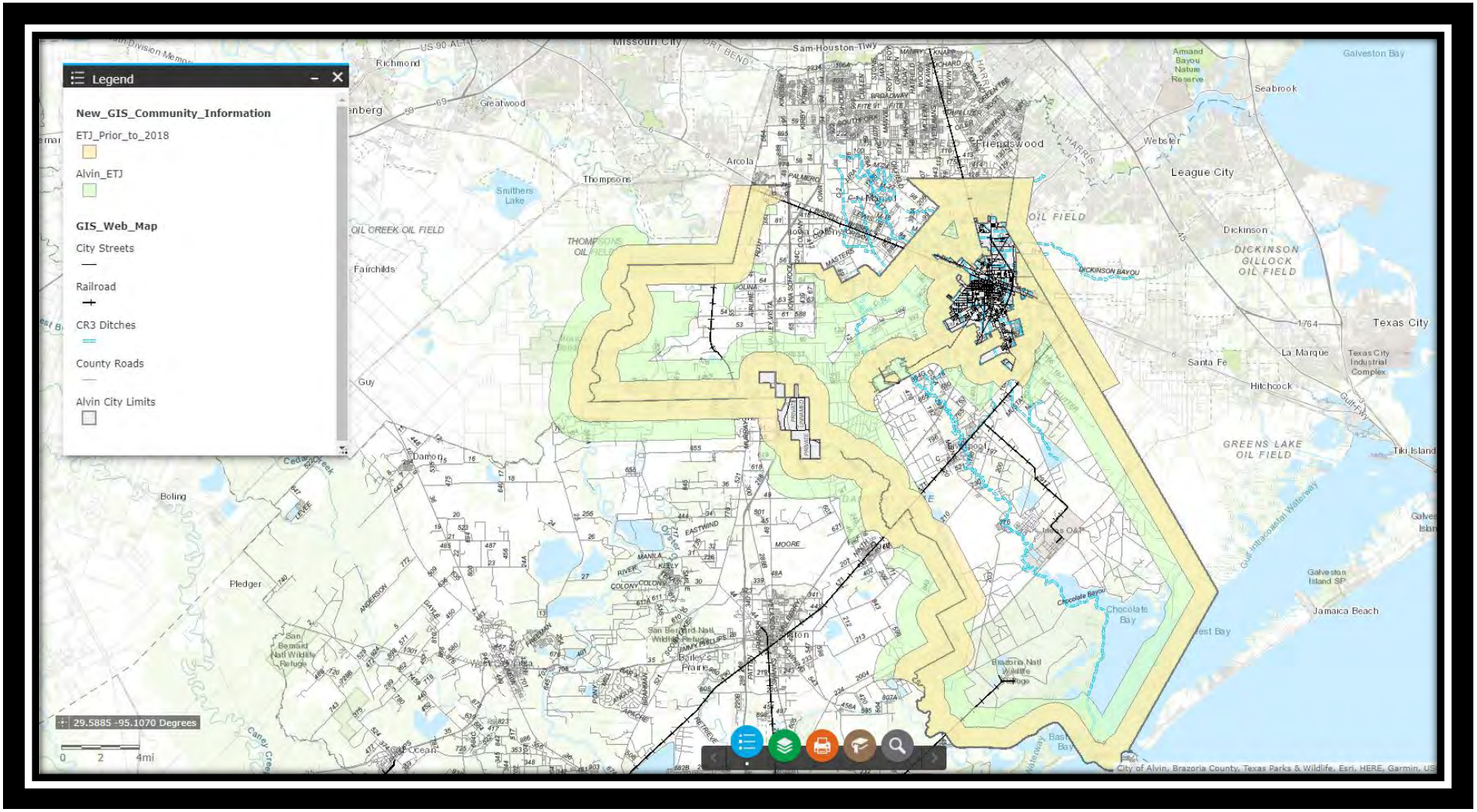
Since the last plan, the City's limits have expanded from 17.3 square miles to 23 square miles including the two square miles of Extraterritorial Jurisdiction (ETJ) outward from the outer edges of the City. Figure B depicts Alvin's (red circle) location within Brazoria County.

Figure B – City of Alvin Location in Brazoria County



As of 2020, the geographic boundaries of the City including the ETJs are shown in Figure C.

Figure C – City of Alvin Limits and Extra Territorial Jurisdiction in Green (ETJ) Map



The 2035 Comprehensive Plan references land use statistics prepared by the Houston-Galveston Area Council (H-GAC). While the report is from 2013, it helps provide an understanding of the breakdown of land use in the City. Using the total area at that time of 12,773.71 acres with the City's corporate limits, which equates to 8,531 parcels, H-GAC divides land use in Alvin in the following ten categories as shown in Table 1-1:

Table 1-1 – Land Categories in Alvin

Land Category	Acres	Parcels	% of Total acreage
Commercial	772.63	444	6.05
Institutional	633.5	207	4.96
Industrial	282.45	98	2.21
Parks and Open Spaces	140.86	31	1.1
Residential	3,119.42	5.410	24.42
Vacant	6,214.03	1,153	48.65
Water	9.66	6	.08
Unknown	1.29	3	.01
Undevelopable	1,521.59	1,146	11.91
Other	78.28	33	.06

Alvin's largest land use designation is vacant, developable land of which 3,137.14 acres of the 6,214 acres is within the Core area of the City. The vacant land ranges in sizes from 0.05 acres to close to 100 acres. The following two maps (Figures D and E) depict the categories. Recognizing the land use is important for long term planning including hazard mitigation planning.

Figure D - Land Use in Alvin Full City Limits

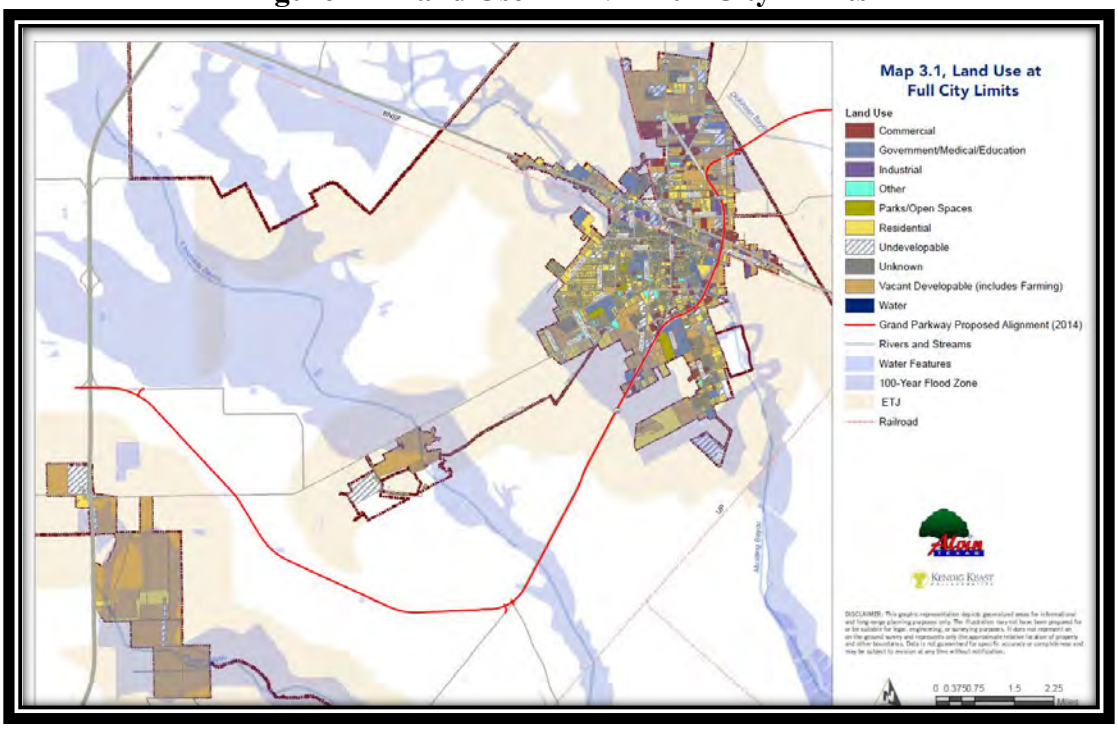
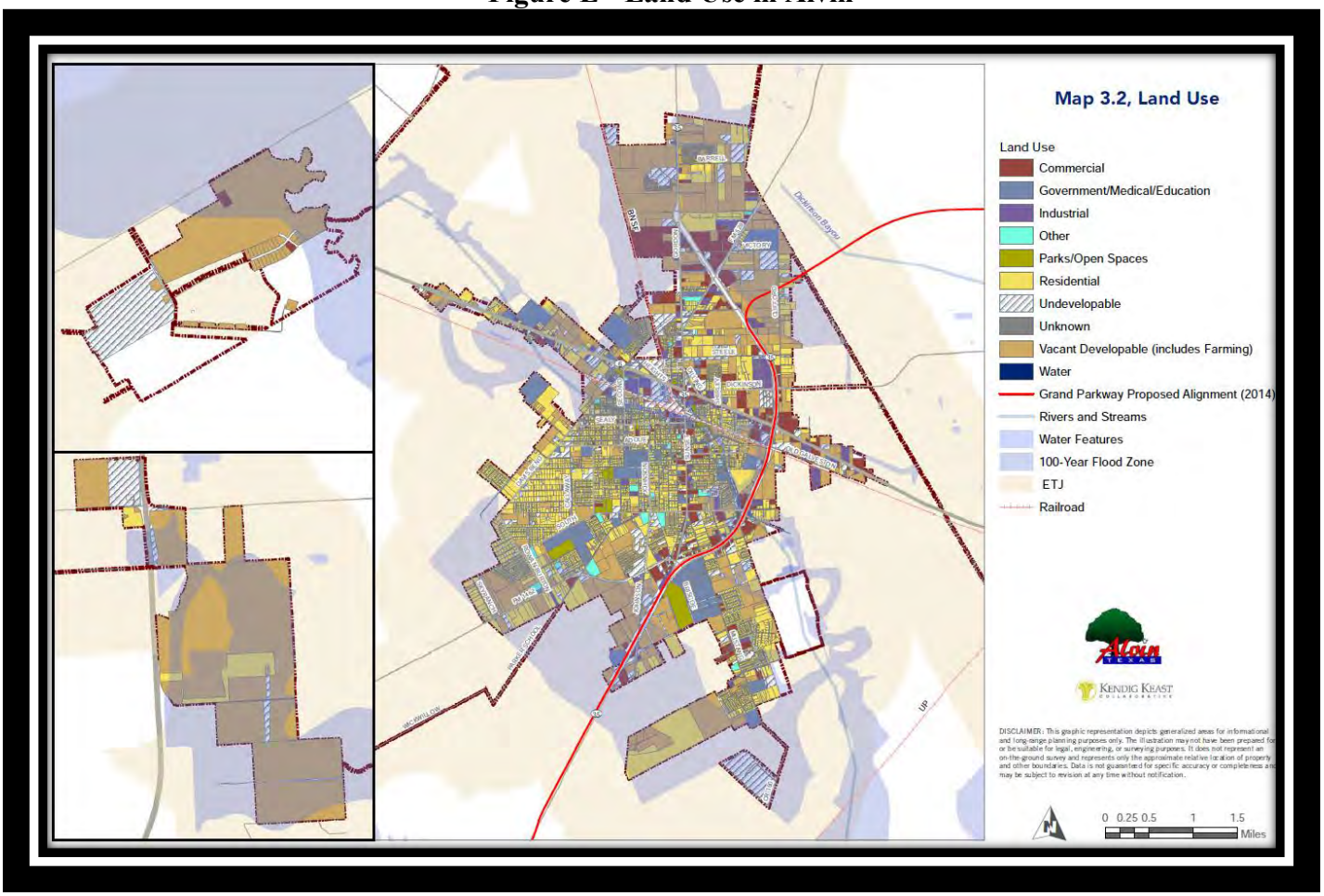


Figure E - Land Use in Alvin



Climate

The climate of southeastern Texas in the area surrounding Houston 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. Alvin receives an average of 51 inches of precipitation each year. Normal monthly rainfall in the area varies from about three inches to over five inches with the heaviest rainfall occurring during May and June.

Population and Growth

The entire State of Texas has grown by nearly almost 20% from 2010 to 2019. The Houston metropolitan area grew by nearly 10%, adding approximately 1.15 million new residents (5.9 million in 2010 U.S. Census Bureau estimate to roughly 7.1 million as of the 2019 estimate). Brazoria County, of which Alvin is one of the incorporated cities, grew 19.5% (313,117 in 2010 estimate to 374,262 in 2019 estimate). The City of Alvin also grew, increasing its population from 24,236 to an

estimated 26,723 residents (10.6%) between 2000 and 2019 as reported in the United State Census Bureau Quick Facts for Alvin, Texas estimates, see Table 1-2.

Table 1-2 - US Census 2019 Estimate – Alvin Texas

Population	Total
Population estimates, July 1, 2019, (V2019)	**26,723**
Population estimates base, April 1, 2010, (V2019)	24,161
Population, percent change - April 1, 2010 (estimates base) to July 1, 2016, (V2019)	10.6%

The table below indicates the population breakdown with approximately 26.1% under 18 years old, 12.4% was 65 years and older, see chart below. It is helpful to understand breakdown of population to help identify potential vulnerable populations.

Table 1-3 - Population Breakdown in Alvin

	Percent Male	Percent Female
Under 5	9.1	7.8
5 to 9	8.0	6.1
10 to 14	6.6	6.5
15 to 19	7.9	6.4
20 to 24	7.4	8.0
25 to 29	9.7	7.2
30 to 34	7.1	5.2
35 to 39	7.1	8.3
40 to 44	4.5	7.5
45 to 49	5.7	7.2
50 to 54	6.6	6.4
55 to 59	4.6	3.6
60 to 64	4.8	5.8
65 to 69	4.1	3.9
70 to 74	2.4	2.8
75 to 79	1.7	2.2
80 to 84	2.1	1.5

As indicated in the Alvin 2035 Comprehensive Plan (2015), accurate population forecasting is critical to long term planning. The 2035 Comprehensive Plan projects future population ranges from a low of 29,972 persons to a high of 36,973 persons, with a "middle: ground" projection figure of 33,472 persons (p.2-8). The future projections (based on historical data) are used to formulate growth policies for the City, see Figure F from the 2035 Comprehensive Plan.

Figure F – Historical Population Chart

Table 2.1, *Historical Population, 1930 - 2010*

Year	Alvin			Brazoria County		Texas	
	Persons	% Change	% County	Persons	% Change	Persons	% Change
1930	1,511		6.6%	23,054		5,824,715	
1940	3,087	104.3%	11.4%	27,069	17.4%	6,414,824	10.1%
1950	3,701	19.9%	8.0%	46,549	72.0%	7,711,194	20.2%
1960	5,643	52.5%	7.4%	76,204	63.7%	9,759,677	26.6%
1970	10,671	89.1%	9.9%	108,312	42.1%	11,196,730	14.7%
1980	16,515	54.8%	9.7%	169,587	56.6%	14,229,191	27.1%
1990	19,220	16.4%	10.0%	191,707	13.0%	16,986,510	19.4%
2000	21,413	11.4%	8.9%	241,767	26.1%	20,851,820	22.8%
2010	24,236	11.6%	10.3%	313,166	22.8%	25,145,561	17.1%

Source: U.S. Census Bureau

As the population trend historically demonstrates, growth trends continue upward for the City, therefore, it is critical for the City to ensure that the existing infrastructure and systems are updated, expanded and developed to accommodate both short-term and long-term growth.

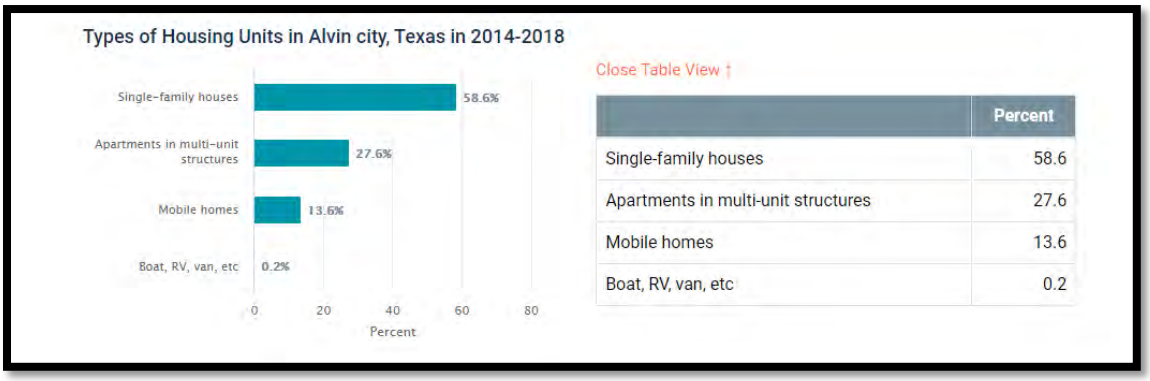
Housing trends are also important to note to help with long term planning for an area. Permit activity in the City continues to grow. Table 1-4 shows the number of residential, and commercial permits filed from 2017-2019 showing an annual increase in both sectors.

Table 1-4 - 2019 Alvin New Building Permit Totals by Year

	Residential	Commercial	Total
2017	156	14	170
2018	142	37	179
2019	205	24	229

In addition, to permit information, the US Census ACS reports data on housing trends.
In 2014-2018, Alvin, Texas had a total of 10,199 housing units. Of these housing units, 58.6 percent were single-family houses either not attached to any other structure or attached to one or more structures (commonly referred to as "townhouses" or "row houses"). 27.6 percent of the housing units were located in multi-unit structures, or those buildings that contained two or more apartments. 13.6 percent were mobile homes, while any remaining housing units were classified as "other," which included boats, recreational vehicles, vans, etc. 6.3 percent of the housing inventory was comprised of houses built since 2010, while 2.2 percent of the houses were first built in 1939 or earlier, see Figure G below.

Figure G – Type of Housing Units in Alvin, 2014-2018



In terms of occupied housing, reviewing 2014-2018 Census data (see Table 1-5), Alvin, Texas had 9,291 housing units that were occupied or had people living in them, while the remaining 908 were vacant. Of the occupied housing units, the percentage of these houses occupied by owners (also known as the homeownership rate) was 60.0 percent while renters occupied 40.0 percent. The average household size of owner-occupied houses was 3.04 and in renter-occupied houses it was 2.46. 23.1 percent of householders of these occupied houses had moved into their house since 2015, while 9.3 percent moved into their house in 1989 or earlier.

Table 1-5 - US Census Population Estimates, 2019, Alvin and 2014-2018 American Community Survey 5 Year Estimates

US Census Housing, Family and Income estimates, Alvin , TX	July 1, 2019-V2019
Housing Units, 2014-2018	10,199
Households, 2014-2018	9,291
Owner-occupied housing unit rate, 2014-2018	60%
Median value of owner-occupied housing units, 2014-2018	$139,900
Median selected monthly owner costs -with a mortgage, 2014-2018	$1,429
Median selected monthly owner costs –without a mortgage, 2014-2018	$497
Median gross rent, 2014-2018	$935
Persons per household, 2014-2018	2.81
Medium household income, 2014-2018	53,714

From 2010-2019, the median value of owner-occupied housing units increased from $38,576 in 2010 to $139,900 in 2019, approximately a 349% increase.

Clearly this growth has increased the amount of people and property at risk from natural hazards. The City of Alvin strictly enforces its floodplain ordinance, with a one-foot freeboard requirement above base flood elevation, 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 Alvin in 2019 was an estimated $53,714 (Source: Quick Facts, Alvin City, Texas, US Census Bureau) compared to $72,270 for the County and $59,570 for the State of Texas. Residents of the City of Alvin education statistics have approximately 16.6% of Alvin's adult population holding a four-year degree or higher and 84.9% 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 Brazoria County is mobile, working in the Houston/Galveston metropolitan areas. A Brazoria County Economic Overview (2017) stated that there were 94,490 jobs in the Count with 43,571 filled by

residents. In addition 97,434 residents commute outside of the county for work, resulting in twice the amount of workers commuting out of the County than in. While there is not Alvin-specific data, the trend is likely very similar for the City. The 2014-2018 Census Estimate indicates that most employed residents commute to work alone (83.7%) as compared to carpooling (11.2%) or public transportation (.2) or walking (1.6) which took them on average 32.6 minutes to get to work.

For the City of Alvin, The Economic Department reports there are approximately 200 businesses located in Alvin, not including public and religious organizations. Table 1-6 lists the major employers with the number of employees in Alvin.

Table 1-6 – Major Employers in Alvin (Source: City of Alvin Economic Department)

Employer	Type	# of Employees
Alvin Independent School District	Education	3,500
Empereon Constar	Customer Support Center	700
Alvin Community College	Education	545
Wal-Mart Associates	Retail	520
Ascend Performance Materials	Petrochemical Manufacturing	470
INEOS Olefins & Polymers USA	Chemical Manufacturing	440
Ron Carter Automotive	Automotive Dealerships	320
Team	Integrated Mechanical Services	257
City of Alvin	Government	247
BeAed	Manufacturing	200
Diversified Ceramics	Manufacturing	91

Land - Community Vision

The City of Alvin updated its 2035 Comprehensive Plan in 2015. The plan guides public policy in terms of, land use and character, parks and recreation, public facilities and services, growth strategies for housing and economic development, mobility, and other important areas. Having a plan provides the City with the opportunity to address issues related to growth and service provision

in a proactive, coordinated manner that promotes the health, safety, and general welfare of residents and provides for a progress review and implementation program and plan.

The City of Alvin also updated its Emergency Management Plan (EMP) in 2016 (some annexes) and 2017 which promotes the public health and safety through goals, objectives and action plans when an emergency or disaster occurs due to natural hazards or manmade hazards. The City, through the Emergency Management Department, maintains an Advanced Level Preparedness Program through routine review, update, and exercise of the EMP. An annex to EMP (Annex P – Hazard Mitigation) specifically reviews and integrates information from this Hazard Mitigation Plan Process and update.

These two plans have provided broad guidance and direction for this hazard mitigation update and in turn this plan update will be used as reference and guidance to those plans as they are reviewed and updated.

FIGURE H – City of Alvin Vision Statement

CITY OF ALVIN VISION STATEMENT

Looking ahead to the Year 2035 and beyond, our vision is to manage growth in a manner that results in predicable development of exceptional quality, improved economic competitiveness, diverse professional and commercial activity, and an enhanced community character; achieve a compatible pattern of land use that sustains property values and supports a blend of housing types for all stages of life and income levels; revitalize downtown as a true city center and community gathering place while preserving Alvin's rich history and unique character; improve transportation efficiency and choices including increased opportunities for walking and bicycling; enhance safe and convenient access to parks and recreation facilities for citizens of all ages, to enable healthy and active lifestyles; protect valued opened spaces and conserve natural resources, for the benefit and integrity of our environment, drainage systems, and community appearance.; efficient use of community facilities and public infrastructure and their adequate provision concurrent with new development,; and an attractive and well-maintained community that we, the Citizens of Alvin, are proud to call home.

Alvin's Hazard Mitigation Plan Goal
The first two iterations of this plan had a goal statement with objective and strategies. This update has consolidated those goals into a more concise statement, as shown in Figure I below.

Figure I – City of Alvin 2020 Hazard Mitigation Goal

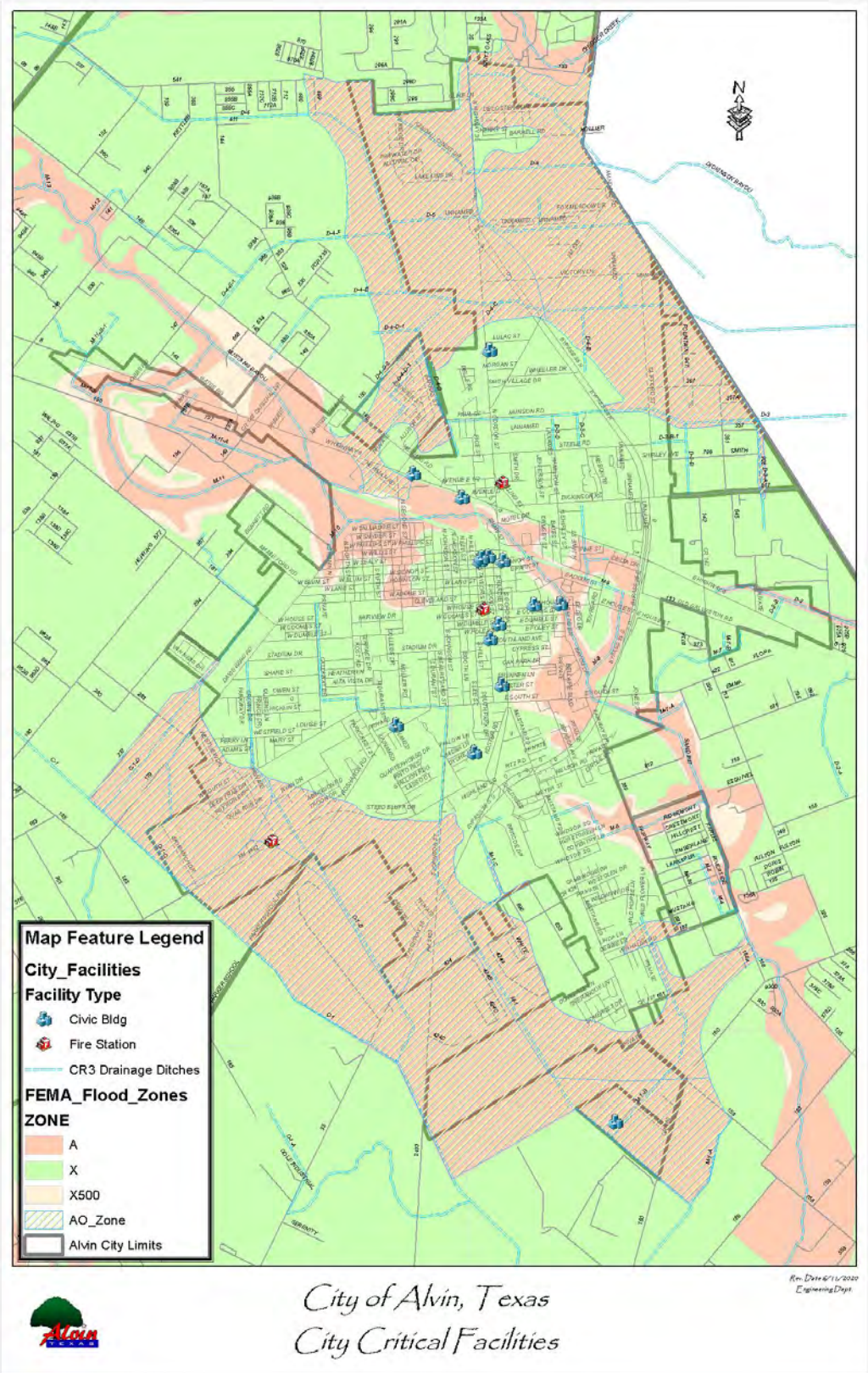
CITY OF ALVIN 2020 HAZARD MITIGATION GOAL
The goal of this plan is to support the City's efforts to protect the community's health, safety, and welfare by identifying and increasing public awareness of natural hazards, and mitigating risks due to those hazards without creating new problems. In addition, The City will work to: • Minimize and prevent damage to public and private buildings and infrastructure • Reduce risk from flood through flood reduction projects, land use and floodplain policies and increased participation in NFIP and CRS by the community • Reduce economic losses • Increase cooperation and coordination among private entities, local agencies, State agencies and Federal agencies • Increase education, outreach, and awareness • Protect natural resources

Community Facilities
The City of Alvin has identified 58 public facilities, ten are considered critical facilities. Table 1-7 lists the ten critical facilities and Figure J shows the location of the critical facilities within the City. There are a number of critical facilities within the City Limits and ETJ that are not owned by the City. Examples include, nursing homes, hospitals, and schools. There are 19 public schools and buildings located within the City of Alvin (Alvin ISD has 40 buildings, however only 19 in City limits), 2 nursing homes, and 1 senior center in the City limits.

Table 1-7 – Critical Facilities in Alvin

Facility Name	Address	Use	Critical
Animal Control	550 W Hwy 6	Animal Control	Yes
Railroad Depot Museum	119 E Willis St.	Historical/Museum	Yes
Public Services Facility	1100 W Hwy 6	Fleet Maintenance	Yes
Senior Center	309 W Sealy St.	Parks/Temp Shelter Essential Employee Depot	Yes
Public Library	105 South Gordon St.	Library	Yes
Waste Water Treatment Plant /Office	7100 CR 160	Utilities/Sewer	Yes
EMS Building - Office & Garage	709 E House St.	Emergency Medical Services	Yes
Fire Station W /8KW Generator	302 W House St.	Fire Protection	Yes
City Hall Building	216 W Sealy St.	Administration	Yes
Alvin Police Station	1500 S Gordon St.	Police	Yes

Figure J - Map of Critical Facilities in Alvin, 2020



SECTION 2 – THE PLANNING PROCESS

Update from the Last Plan

- Removed history of Alvin
- Added detailed local capabilities assessment and 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

Alvin followed a well-established planning process to update its Hazard Mitigation Plan (HMP). The process is fully documented in the original plan, but substantial parts of that plan have been eliminated from this update in order to keep the current document to a reasonable length. The City maintains a copy of the original and updated plan, which can be reviewed upon request.

The mitigation planning process for the 2020 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 City of Alvin HMP Update

Team Member	Title	Department	Role/Responsibility
Michelle Segovia	City Engineer	Engineering	Data collection, analysis of hazards, identify actions Review drafts
Ron Rosenwald	GIS Coordinator	Engineering	Data collection, analysis of hazards, identify actions Review drafts

Team Member	Title	Department	Role/Responsibility
			Mapping support
Ron Schmitz	EMS and EM Director	Emergency Management	Data collection, analysis of hazards, identify actions Review drafts
Brandon Moody	Director	Public Services	Data collection, analysis of hazards, identify actions Review drafts
Shana Church	Executive Secretary	Engineering	Data collection 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 City-owned buildings, impacts of recent hazard events (including Hurricane Harvey), 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 May 27, 2020. 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 City 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.

The second MPC meeting was held on June 10, 2020. The purpose of the meeting was to review the status of various tasks, to identify the stakeholders and to 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 City risk assessment, and developing and prioritizing potential mitigation actions and projects.

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

Organization	Point of Contact	Title	Method of Invite
Friendswood	Morad Kabiri	City Manager	Letter
Friendswood	Brian Mansfield	Fire Marshall/Emergency Management Coordinator	Letter
Pearland	Clay Pearson	City Manager	Letter
Manvel	Kyle Jung	City Manager	Letter
Santa Fe	Glen Adams	City Manager	Letter
Angleton	Chris Whittaker	City Manager	Letter
Angleton	Glen LaMont	Emergency Management Coordinator	Letter
Alvin ISD	Carol Nelson	Superintendent	Letter
Alvin ISD	Don Rabalais	Chief of Safety	Letter
Alvin Community College	Christal Albrecht	President	Letter
Brazoria County	Matt Hanks	County Engineer	Letter
Harris County	John Blount	County Engineer	Letter
C&R3	Richard McLaren	General Manager	Letter
BDD4	John Genaro	Superintendent	Letter
BDD5	Robert Vincent, Jr.	Superintendent	Letter
Other departments in Alvin	Michelle Segovia	City Engineer	Letter
Alvin/Manvel Chamber of Commerce	Johanna McWilliams	President/CEO	Letter

During the third meeting on June 17, 2020, the MPC focused on updating critical facilities list, reviewing and updating City capabilities and find areas of improvement, and discussion of new action plan including action items.

The July 8, 2020 meeting focused on prioritizing the new actions and reviewing the draft presentation and plan for the first public meeting. A schedule was prepared, see Table 2-3:

Table 2-3 – Plan Update Schedule

Date	Description
7-8-20	Draft to MPC for review. Letter to stakeholders sent requesting input
7-16-20	**First Public Meeting**
7-29-20	Data collections and review. Comments from first public meeting incorporated; updating all sections after meeting
8-3-20	Letters to stakeholders drafted, second draft review
8-18-20	Stakeholders contacted regarding public meeting and providing process for providing comments from review

Date	Description
9-3-20	**Second Public Meeting**
9-4-20	Plan uploaded to City Website; Public given 30 days to review and provide comments
10-5-20	Comment cycle closes and comments incorporated
10-7-20	MPC Meeting to review comments for incorporation
10-16-20	Plan is finalized to be sent to TDEM for review process

The MPC met July 29, 2020 to review initial input from the public and further refined the draft.

The MPC finalized the draft for stakeholder input at the August 3, 2020 meeting and the email was sent with the draft for stakeholder review and comment.

The MPC presented the draft at the City Council meeting on September 3, 2020 explaining how the public can retrieve the draft and provide comments and input.

As no public feedback was received, the MPC reviewed the final, incorporated draft the week of October 12, 2020 with the goal to finalize and submit to the State on October 16, 2020.

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 Council and 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 Council for its consideration and to initiate public review and comment. The draft plan update was posted to the City'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.
- There were no comments from the public. The MPC finalized the draft and submitted it to TDEM for review and FEMA approval.

Community Participation
Consistent with the City's standard practice of informing, engaging and involving citizens, and to fulfill public participation requirements of the mitigation planning programs, the City 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 City's Council's chambers. The first meeting

was during a City Council meeting where the presentation was an agenda item. The City followed its notice procedures to announce the agenda 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. No public feedback was received. For the draft update, The City published public notices on August 23 and on August, 30 2020 about the draft plan in *The Alvin Sun Advertiser* before the meeting (See Appendix D, Public Notice Document) and on the City's website.

Local Capabilities Assessment and Integration

The City of Alvin is governed by the Council/Manager form of government in accordance with the Home Rule Charter adopted by the voters in February 1971. The City Council is the legislative and policy-making body of the City. It consists of the Mayor and 7 Council members elected at-large for 3-year, staggered terms. The Mayor and Council provide community leadership, develop policies to guide the City in delivering services and achieving community goals, and encourage citizen awareness and involvement.

The City Manager, hired by the Council, manages and prepares the budget for Council's consideration, manages government staff, provides policy recommendations for Council consideration and final decision and carries out Council's policies. The City has 23 Departments and Utilities. Over the past ten years, the City has created or merged departments to better address hazard mitigation. In addition, the City works hard to ensure that these 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 City of Alvin Departments and Utilities with the Departments that are directly involved in mitigation efforts highlighted, recognizing that many of the other departments support the lead department for mitigation efforts.

Table 2-4 - City of Alvin Departments and Utilities in Alphabetical Order

Animal Shelter	**Financial Services**	**Parks and Recreation**
City Secretary	**Fire Department**	**Permits and Inspections**
City Manager	**Geographical Information Systems**	**Police Department**
Code Compliance	**Human Resources Department**	**Public Services**
Convention and Visitors Bureau	**Information Technology Office**	**Purchasing**
Economic Development	**Legal Department**	**Senior Center**
Emergency Management/ Medical Services Department	**Municipal Court**	**Water Utility and Garbage Collection**
Engineering Department	**Oak Park Cemetery**	

The City also has a Parks and Recreation Board, a Building Board of Adjustments and Appeals, and a Planning Commission comprised of citizens and supported by government staff that support hazard

mitigation efforts. The MPC reviewed existing City's capabilities, considering authorities, policies, programs and resources available.

The Capability Assessment describes the tools in the City'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 K):

Figure K – Categories for Capabilities Assessment

With respect to planning for and responding to natural hazard events, the key elements of the City is well equipped in all four categories. Table 2-5 describes the City's Departments that are involved in mitigation general responsibilities.

Table 2-5 - City of Alvin Department Involved in Mitigation Efforts

Departments/ Commissions	General Responsibilities
City Manager	Day-to-day management and oversight of City departments and budget.
City Secretary	Maintains permanent records including ordinances, resolution, meeting minutes.
Economic Development	Supports community's economic vitality through the attraction, retention and expansion of primary employers. Works to ensure business climate and built environment strongly support these efforts by focusing on aesthetics, infrastructure, quality of life, image, workforce and quality development and redevelopment.

Departments/ Commissions	General Responsibilities
Emergency Management/ Emergency Medical Services	Responsible for the planning and implementation of the City's comprehensive Emergency Management Program, which guides the City through each of the four phases of emergency management: preparedness, response, recovery, and mitigation.
Engineering Department	Provides engineering planning, design, and construction administration for street, storm drainage, water, and sewer projects in Alvin in addition to providing technical support to other City departments. The department also provides engineering review of subdivision plats and plans, building site plans for proposal inside the City limits and review and construction inspections of subdivision improvements within the City and the ETJ. The department maintains record drawings of construction improvements and topographic maps. Also responsible for management and oversight of all CIP projects approved by the City Council, including roads, bridges, and public buildings.
Financial Services	Responsible for providing fiscal control and guidance for all financial transactions of the City. In addition, Finance is responsible for complying with all applicable local, state and federal requirements. The department is composed of several programs; Accounting Program, Municipal Court and Utility Billing program.
Fire Department	Alvin Volunteer Fire Department protects life, property, and to respond to other emergencies that might arise in the community through public education, management, and incident response, made up of 5 paid support staff and 70 volunteers, protects 78,000 people living in an area of 100 square miles throughout the Alvin area including portions of Brazoria County.
GIS	Geospatial Information Technology, GIS, is part of engineering department that provides mapping capabilities for planning.
Legal	Provides legal advice and recommendations to the Mayor, City Council, City Manager and other City employees. The City Attorney conducts legal research and drafts ordinances, resolutions, contracts, real estate documents, and all forms of legal documents for the City.
Parks and Recreation	Oversees the development and construction of all City parks and recreation facilities and is responsible for building and lawn maintenance for all City structures and facilities.
Permits and Inspections	Permits and inspections are required by the City of Alvin's Code of Ordinances to ensure safe construction with sound materials. New commercial and home construction requires two sets of engineered sealed drawings, and a survey & plot plan. Permits and Inspections are required for new construction, remodeling, and repairs. Residential owners wishing to remodel or repair their homes. Applicants wishing to place or repair homes located within manufactured home parks must hire a mechanical service company for any type of hook-ups or repairs. Once construction has begun, inspections are necessary throughout the construction process to assure compliance with safety standards and City regulations.
Police Department	Consists of 80 paid members, 50 of which are sworn police officers (including the Chief of Police), with the remaining 30 employees holding civilian positions. With an annual operating budget of approximately $7.5 million, the Alvin Police Department offers a variety of services to improve the public safety and quality of life in our community.

Departments/ Commissions	General Responsibilities
Public Services	Responsible for maintaining the City's Infrastructure, excluding parks and buildings, providing customer service assistance to citizens for water, sewer, streets & drainage issues.
Building Board of Adjustments and Appeals	Provides review for appeals of orders, decisions or determinations made by the building official relative to the application and interpretation of the codes,
Parks and Recreation Board	The parks and recreation board shall be an advisory body and shall act only in an advisory capacity to the city council. The board shall advise and make recommendations to the city council concerning the acquisition, development, improvement, equipment and maintenance of all parks and public playgrounds owned or controlled by the city within and without the corporate limits. It shall be the duty of the board, subject to such organizations and activities as the board may itself establish internally, to advise the city council concerning the future development of public parks, playgrounds and recreational facilities for the city, to study and recommend the purchase of additional lands and sites for parks, playgrounds and recreational facilities, and further to advise the city council concerning improvements in the maintenance, operation and general welfare of existing public parks, playgrounds and recreational facilities and the use of the same by the public. With reference to the development of new parks and playgrounds, it shall be the duty of the board to outline the general plan of development, including landscaping, roads, trails, buildings and equipment, which plan shall be submitted to the city manager for detailed development, after which such plan shall be submitted to the city council for adoption or change in the discretion of the city council.
Planning Commission	(a)Be responsible to and act as an advisory body to the council.(b)Submit findings and recommendations to the council concerning the making, amending, extending and adding to a master plan for the physical development of the city.(c)Review all plans for platting or subdividing of land within the city and within adjacent areas as permitted by law and submit findings and recommendations to the council.(d)Submit annually to the city council, not later than April first, a list of recommended capital improvements found necessary or desirable for each of the next three (3) budget years.(e)Perform such other duties and be vested with such other powers as the council may prescribe in accordance with the laws of the State of Texas.

Administrative and Technical Resources

The City of Alvin has many of the staff trained and skilled to support mitigation planning and actions including:

- Building and Code Officials
- Floodplain Manager
- Emergency Manager
- Community Planner
- Civil Engineer
- GIS Coordinator and
- Public Services Director

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.

In addition to the staff, the City has three Boards/Commissions that are staffed by mitigation trained employees to support the Citizen Board's work. The City has tree trimming, clearing of its drainage and storm water facilities programs and mutual aid agreements with other neighboring Cities, Brazoria County and Brazoria County Drainage Districts to support and coordinate mitigation efforts.

Building Code Staff Capabilities

The City employs four building inspectors, five plans examiners, and five code enforcement officers (one focuses on health inspections, 4 focus on code enforcement and nuisance abatement violations); all building officials are certified and licensed by the International Code Council (ICC) and all code officials are licensed through TDLR, Texas Department of Licensing and Registration.

Inspections. Alvin conducts inspections of all permitted development. A series of inspections is conducted on every building, ranging from foundation and framing, mechanical and electrical, plumbing, and fire code inspections. As a consequence of recent growth, the total number of inspections has risen in recent years.

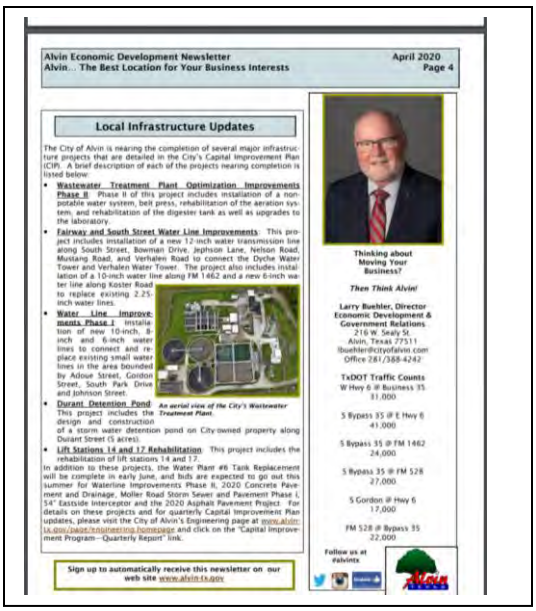
With regard to floodplain development, a permit is required to do any of the following in a floodplain: build, rebuild, bring in fill dirt, re-grade the land, excavate, add on to or improve a home or business, place a manufactured or mobile home unit, install an underground or above-ground tank, subdivide land, and place accessory buildings and temporary structures. New and improved buildings and additions, including manufactured homes, must be elevated minimum 12 inches 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 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 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 City has instituted many systems and programs to support mitigation efforts including:

- The City's Emergency Management Department is responsible for coordinating emergency planning, preparation and response, under the oversight of a full-time Emergency Management Coordinator. The City maintains an Emergency Management Plan (EMP) – which was reviewed in 2016 (some appendices including Hazard Mitigation appendix) and 2017, In addition to the emphasis on hazard mitigation in this appendix P of the EMP, the City prepares by participating in internal and external training and exercises several times a year.
- Alvin also has early notification service, Blackboard Connect, which allows officials to disseminate messages to those residents and businesses who have registered to receive emergency notification through a single telephone call, text message, or email. City leadership, staff and many residents rely on official weather forecasts issued by the National Weather Service (NWS) office in League City, Texas. The City pays for a weather service that sends weather updates and alerts to Emergency Services, including the Police and Fire Departments. Emergency Management staff routinely monitor the weather forecast and circulate NWS warnings and advisories to alert leadership and staff of hazardous weather. The City residents can also keep up to date through local radio station 740 KTRH AM, the City of Alvin's social media platforms, and the City's website.
- Hurricane and Other Hazard Preparedness: The City, in conjunction with the County prepares and distributes annually a Disaster and Hurricane Guide to help residents with identifying hazards, preparing home, auto, boat in advance of disasters, evacuation support and plans for your family, pets and livestock, emergency shelters and, and information to prepare to return home. The 22 page document is mailed to homeowners, can be reviewed at the City's website and downloaded as well. It is updated and distributed annually to the residents and businesses in Alvin.

- Alvin Economic Development Newsletter: The City prepares a quarterly newsletter to keep residents informed of important information and developments affecting the City and its citizens
- New releases: Residents can subscribe to receive the latest news and information released by the City.
- To facilitate the City's early flood warning capabilities, The City has one rain gauge located at Alvin Wastewater Treatment Facility (WWTP), located at 7100 Country Road.



Alvin Economic Development Newsletter
Alvin... The Best Location for Your Business Interests

April 2020
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Local Infrastructure Updates

The City of Alvin is nearing the completion of several major infrastructure projects that are detailed in the City's Capital Improvement Plan (CIP). A brief description of each of the projects nearing completion is listed below:

- **Wastewater Treatment Plant Optimization Improvements Phase II**: Phase II of this project includes installation of a non-potable water system, belt press, rehabilitation of the aeration system, and rehabilitation of the digester tank as well as upgrades to the laboratory.
- **Fairway and South Street Water Line Improvements**: This project includes installation of a new 12-inch water transmission line along South Street, Bowman Drive, Jephson Lane, Nelson Road, Mustang Road, and Verhalen Road to connect the Dyche Water Tower and Verhalen Water Tower. The project also includes installation of a 10-inch water line along FM 1462 and a new 6-inch water line along Koster Road to replace existing 2.25-inch water lines.
- **Water Line Improvements Phase I**: Installation of new 10-inch, 8-inch and 6-inch water lines to connect and replace existing small water lines in the area bounded by Adoue Street, Gordon Street, South Park Drive and Johnson Street.
- **Durant Detention Pond**: This project includes the design and construction of a storm water detention pond on City-owned property along Durant Street (5 acres).
- **Lift Stations 14 and 17 Rehabilitation**: This project includes the rehabilitation of lift stations 14 and 17.

An aerial view of the City's Wastewater Treatment Plant.

In addition to these projects, the Water Plant #6 Tank Replacement will be complete in early June, and bids are expected to go out this summer for Waterline Improvements Phase II, 2020 Concrete Pavement and Drainage, Moller Road Storm Sewer and Pavement Phase I, 54" Eastside Interceptor and the 2020 Asphalt Pavement Project. For details on these projects and for quarterly Capital Improvement Plan updates, please visit the City of Alvin's Engineering page at www.alvin-tx.gov/page/engineering.homepage and click on the "Capital Improvement Program--Quarterly Report" link.

Sign up to automatically receive this newsletter on our web site www.alvin-tx.gov

Thinking about Moving Your Business?

Then Think Alvin!

Larry Buehler, Director
Economic Development & Government Relations
216 W. Sealy St.
Alvin, Texas 77511
lbuehler@cityofalvin.com
Office 281/388-4242

TxDOT Traffic Counts
W Hwy 6 @ Business 35 31,000
S Bypass 35 @ E Hwy 6 41,000
S Bypass 35 @ FM 1462 24,000
S Bypass 35 @ FM 528 27,000
S Gordon @ Hwy 6 17,000
FM 528 @ Bypass 35 22,000

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Figure L - Alvin Monthly Rainfall Totals Per Year - 2015-2020

2015	inches	2016	inches	2017	inches	2018	inches	2019	inches	2020	inches
JAN	9.90	JAN	7.09	JAN	5.91	JAN	10.78	JAN	5.88	JAN	6.82
FEB	1.40	FEB	2.48	FEB	2.41	FEB	6.06	FEB	2.93	FEB	1.149
MARCH	8.50	MARCH	4.94	MARCH	3.78	MARCH	2.92	MARCH	0.52	MARCH	1.03
APRIL	8.60	APRIL	4.72	APRIL	6.60	APRIL	1.97	APRIL	1.98	APRIL	2.28
MAY	9.50	MAY	9.05	MAY	4.11	MAY	2.3	MAY	10.44	MAY	
JUNE	10.00	JUNE	6.92	JUNE	6.93	JUNE	3.89	JUNE	9.93	JUNE	
JULY	0.50	JULY	1.01	JULY	3.22	JULY	7.55	JULY	4.2	JULY	
AUG	6.31	AUG	8.8	AUG	30.61	AUG	3.51	AUG	5.03	AUG	
SEPT	7.36	SEPT	1.63	SEPT	1.63	SEPT	17.95	SEPT	12.13	SEPT	
OCT	10.85	OCT	0.13	OCT	4.43	OCT	9.13	OCT	8.5	OCT	
NOV	4.41	NOV	4.76	NOV	0.11	NOV	3.62	NOV	3.16	NOV	
DEC	2.99	DEC	7.00	DEC	5.01	DEC	6.33	DEC	2.26	DEC	
TOTAL	80.32	TOTAL	58.53	TOTAL	74.75	TOTAL	76.01	TOTAL	66.96	TOTAL	11.279

In addition, after Hurricane Harvey, the City has now designated additional staging and sheltering location at the Senior Center. The City continues to pursue various initiatives to enhance its emergency response capability, particularly flood response.

Administrative and Technical Review Recommendation to support City Mitigation Efforts:

Many of the Departments are responsible for several facets of mitigation so while the work is done well and coordinated, the City could benefit from adding staff to support a full time floodplain administer, grant expert and HAZUS and other hazard data analysis expert.

While the one gauge is helpful, the City could benefit from additional gauges placed at strategic locations throughout the City.

Regulatory and Planning

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

The City has several City plans used for long term planning that were drafted in a holistic, collaborative forum that includes action or projects to help mitigate damage from natural hazards where applicable including:

- Alvin 2035 Comprehensive Master Plan
- 2021-2025 Adopted Capital Improvements Program
- 2017 Alvin Emergency Management Plan
- 2016 Alvin Utility Master Plan
- 2019 Alvin Drought Contingency Plan
- 2013 Northern Brazoria County/Pearland Sub regional Planning Initiative Transportation and Land Use Vision Plan Report and Implementation Workbooks
- Alvin Thoroughfare Plan

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, future growth information from Alvin's comprehensive master plan helped the development of actions based on this information.

Brief definitions of each plan can be found in Table 2-6.

Table 2-6 - Description of Existing Plans, City of Alvin

Existing Plans, City of Alvin
Name: 2035 City of Alvin Comprehensive Master Plan **Description:** Overall policy guide for future growth, land use and development **Relationship to Natural Hazard Mitigation Planning:** High level view outlining the citizens of Alvin's vision for future growth (infrastructure, parks, land development restrictions).
Name: 2021-2025 Adopted Capital Improvements Program **Description:** The purpose of the City of Alvin's Capital Improvement Program (CIP) is to provide clear direction and planning for sustainable infrastructure to our community both today and into the future. Through a comprehensive and fiscally responsible approach executed by a well governed municipal government, this five-year CIP addresses the needs of the City, from water and sewer line work to street paving, new roadways, drainage, park improvements and facility maintenance and development. **Relationship to Natural Hazard Mitigation Planning:** Takes understanding of natural hazard issues and provides project ready and budget needs to support projects many of which mitigate natural hazards.
Name: 2017 Alvin Emergency Management Plan **Description:** This basic plans outlines the City's approach to emergency operations as applicable to the City of Alvin. It provides general guidance for emergency management activity and an overview of our methods of mitigation, preparedness, response and recovery. **Relationship to Natural Hazard Mitigation Planning:** Emergency Operations plan for events either natural or manmade.

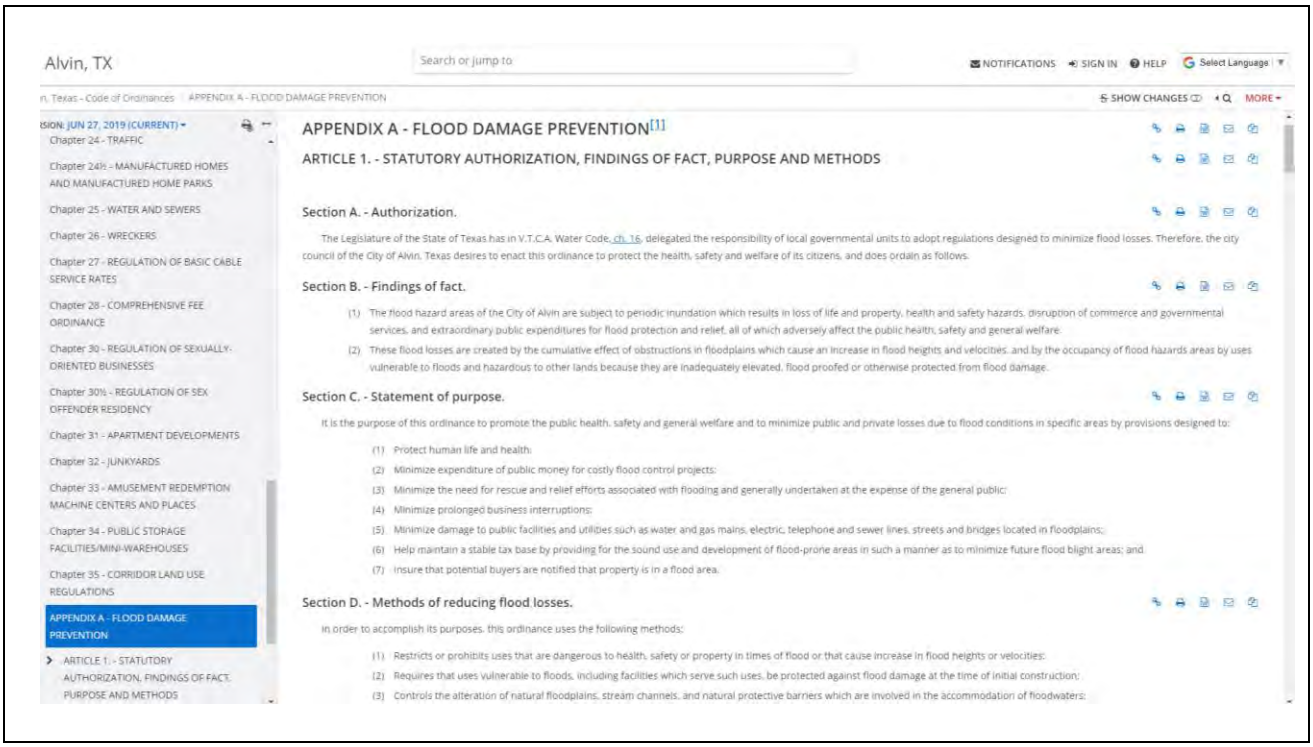
Existing Plans, City of Alvin
Name: 2016 Alvin Utility Master Plan **Description:** Accommodating this growth in an efficient and cost effective manner, while also focusing on the maintenance of existing water and wastewater system assets, is the purpose of this 2015 Utility Master Plan. This report has been prepared to provide the City of Alvin a planning tool that will serve as a guide for short-term and long-term improvements to the infrastructure within the water and wastewater systems. **Relationship to Natural Hazard Mitigation Planning:** Utility plan guides the CIP plan mentioned above and is a twenty year look ahead as opposed to the CIP which is a five year look ahead.
Name: 2019 Alvin Drought Contingency Plan **Description:** The purpose of the plan is to conserve the available water supply and to protect the integrity of water supply facilities. The plan places emphasis on domestic water use, sanitation, and fire protection, and protection of public health, welfare, and safety. **Relationship to Natural Hazard Mitigation Planning:** Provides for planning in advance of a drought event so that the processes are established and well known before the event occurs.
Name: 2013 Northern Brazoria County/Pearland Sub regional Planning Initiative (SPI)Transportation and Land Use Vision Plan Report and Implementation Workbooks **Description:** The SPI process focuses on innovative strategies including the coordination of transportation and land use and locally driven actions that support regional and sub-regional goals. **Relationship to Natural Hazard Mitigation Planning:** High level view outlining citizens of Brazoria County's vision for future growth (infrastructure, parks, and land development restrictions).
Name: Alvin Thoroughfare Plan **Description:** It is a long-range plan (50+ years) that identifies the location and type of roadway facilities that are needed to meet projected long-term growth within the area. The Thoroughfare Plan is not a list of construction projects but rather a tool to enable Counties and/or Cities to preserve corridors for transportation system development as the need arises. Alvin's thoroughfare plan focuses on efficient movement of truck traffic through the community and provides an effective evacuation route away from the Gulf Coast. **Relationship to Natural Hazard Mitigation Planning:** Transportations plan and evacuation route plans during and natural or manmade event.

From a regulatory perspective, The City of Alvin regulates development in a well-planned manner that is consistent with the City's vision for its future. As a fast-growing community, the City is committed to developing to serve the best interests of all its residents and business interests. The City of Alvin provides a Code of Ordinance on its website:

https://library.municode.com/tx/alvin/codes/code_of_ordinances

Link on its website to provide the ordinance text for the public, as shown in Figure M. It can be found at: https://library.municode.com/tx/alvin/codes/code_of_ordinances.

Figure M Example of Ordinance Information for Alvin



Alvin, TX

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NOTIFICATIONS SIGN IN HELP Select Language

n, Texas - Code of Ordinances APPENDIX A - FLOOD DAMAGE PREVENTION

SHOW CHANGES MORE

SION: JUN 27, 2019 (CURRENT)

Chapter 24 - TRAFFIC

Chapter 24½ - MANUFACTURED HOMES AND MANUFACTURED HOME PARKS

Chapter 25 - WATER AND SEWERS

Chapter 26 - WRECKERS

Chapter 27 - REGULATION OF BASIC CABLE SERVICE RATES

Chapter 28 - COMPREHENSIVE FEE ORDINANCE

Chapter 30 - REGULATION OF SEXUALLY-ORIENTED BUSINESSES

Chapter 30½ - REGULATION OF SEX OFFENDER RESIDENCY

Chapter 31 - APARTMENT DEVELOPMENTS

Chapter 32 - JUNKYARDS

Chapter 33 - AMUSEMENT REDEMPTION MACHINE CENTERS AND PLACES

Chapter 34 - PUBLIC STORAGE FACILITIES/MINI-WAREHOUSES

Chapter 35 - CORRIDOR LAND USE REGULATIONS

APPENDIX A - FLOOD DAMAGE PREVENTION

ARTICLE 1. - STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE AND METHODS

APPENDIX A - FLOOD DAMAGE PREVENTION[1]

ARTICLE 1. - STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE AND METHODS

Section A. - Authorization.

The Legislature of the State of Texas has in V.T.C.A. Water Code, ch. 16, delegated the responsibility of local governmental units to adopt regulations designed to minimize flood losses. Therefore, the city council of the City of Alvin, Texas desires to enact this ordinance to protect the health, safety and welfare of its citizens, and does ordain as follows.

Section B. - Findings of fact.

(1) The flood hazard areas of the City of Alvin are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, all of which adversely affect the public health, safety and general welfare.

(2) These flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities, and by the occupancy of flood hazards areas by uses vulnerable to floods and hazardous to other lands because they are inadequately elevated, flood proofed or otherwise protected from flood damage.

Section C. - Statement of purpose.

It is the purpose of this ordinance to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

(1) Protect human life and health;

(2) Minimize expenditure of public money for costly flood control projects;

(3) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

(4) Minimize prolonged business interruptions;

(5) Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains;

(6) Help maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize future flood blight areas; and

(7) Insure that potential buyers are notified that property is in a flood area.

Section D. - Methods of reducing flood losses.

In order to accomplish its purposes, this ordinance uses the following methods:

(1) Restricts or prohibits uses that are dangerous to health, safety or property in times of flood or that cause increase in flood heights or velocities;

(2) Requires that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

(3) Controls the alteration of natural floodplains, stream channels, and natural protective barriers which are involved in the accommodation of floodwaters;

The City has ordinances for building code, permitting and inspections, regulation in floodplain, subdivision, storm water, parks and recreation, street and sidewalks and flood damage prevention. These ordinances continue to be effective measures for reducing hazard impacts and have been administered and enforced by the City.

The City uses the following codes shown in Table 2-7 and has the following rating or review to help support mitigation efforts.

Table 2-7 - Building Codes and Scoring/Rating/Year

Building Code/Permit/Inspection	Yes/No	Version/Year Score or Rating
Building Code	Yes	Adopted Code References are the 2018 ICC codes (IRC), 2017 NEC, 2018 IECC, 2018 IFC, 2015 Med Gas NFPA 99, 140 mph winds per code table.
Building Code Effectiveness Grading Schedule Score (BCEGS)	Yes	Residential Score: 4 Commercial Score: 4
Fire Department ISO Rating	Yes	Rating: 2
Site plan review Requirement	Yes	Yes, for details, see the Subdivision Ordinance and Design Criteria Manual

Engineering Design Criteria Manual. The City of Alvin updated its Engineering Design Criteria Manual in 2017 that helps parties interested in development understand design requirements and approvals required prior to any construction.

As noted earlier, the City of Alvin has experienced growth in recent years, especially in new construction. Table 2-8 summarizes the residential and commercial building permit statistics between Alvin's Hazard Mitigation plan approved in 2016 and this 2020 update. The table demonstrates the continued growth in new residential and commercial construction in Alvin.

Table 2-8 - Comparison of Building Permits (Source: City of Alvin)

Plan	Alvin HMP (using for 2006-2011 data)	Alvin HMP (using for 2015-2020 data)
Residential	567	879
Commercial	13	93
Total	580	972

Regulatory Support for Hazard Specific Mitigation

As part of its rules for regulating growth, the City recognizes the importance of certain measures to limit damage and exposure of citizens and structures to floods, high wind hazards, and drought.

Flood Hazards

The City of Alvin administers a suite of regulations and ordinances that combine to comprehensively regulate flood hazard areas to minimize exposure of people and property. Administration of these provisions is the joint responsibility of the City's Floodplain Manager (in the Engineering Department) and the Building Code Officials (also located in the Engineering Department). In approved subdivisions that include floodplain areas, a building permit is required for construction of individual homes. The minimum elevation approved as part of the subdivision approval is verified by the building plans reviewers through the required elevation certificate. Further, subdivision plats are examined for special notes, even if there is no floodplain within the subdivision.

Floodplain Administrator. The City Engineer is responsible for the maintenance and enforcement of the City's floodplain and floodway ordinances as mandated by the National Flood Insurance Program (NFIP). The City Engineer operates as the City's Floodplain Administrator. The City is a member of the NFIP but not a CRS member.

Processing Floodplain Development Proposals. Most homes built in the floodplain are slab-on-grade, elevated by the placement of fill. Elevation Certificates are required before the slab is poured as part of the Form Frame inspection and can be reviewed on the City's website. City regulations require that the lowest floor, including basement, be at least one-foot above the Base Flood Elevation.

The City requires the surveyor to approximately delineate the floodway and floodplain for all of the proposed development site plans. Construction plans must be signed by a Professional Engineer licensed by the Texas Board of Professional Engineers. Projects requiring revision to the floodplain must go through Conditional Letter of Map Revision (CLOMR) based on Fill prior to approval of construction plans. Similarly, any projects located within the FEMA mapped 100-year floodplain must mitigate the loss of floodplain volume. The City staff compares and verifies the information using FEMA's Flood Insurance Risk Maps (FIRM) as well as the City's GIS floodplain information.

Reviewing and Approving Subdivisions. The subdivision ordinance outlines the requirements for the design, review, and approval of subdivisions within the City and the area designated as the extra-territorial jurisdiction (ETJ). Preliminary plans are required to show waterways, drainage structures, and the flood elevations and boundaries of flood-prone areas (including floodways). If the proposal includes fills or other structural elevation techniques, levees, channel modifications, or other methods to overcome flood or erosion-related hazards, they must be designed in compliance with the City's base flood elevation standards and the City's flood hazard prevention requirements.

Each recorded plat that includes lots that are affected by the floodplain, must indicate the required lowest floor elevation. When permit applications for individual buildings are received, the building permit includes the elevation requirements.

The City conducts an inspection of subdivision grading and drainage work to validate compliance with the grading plan. At this time, elevations of the fill pads for proposed buildings in flood hazard areas are verified for the required elevation.

Permitting for Substantial Improvements. Every application for renovation, improvement, or repair of existing buildings is examined by City staff to determine if the building is located in the mapped flood hazard areas. The City's Floodplain Administrator must review and approve any permits on existing, flood-prone buildings.

Applicants are required to submit the value of work proposed. For applications in the floodplain, that value is compared to the assessed value to assess whether the proposed work constitutes a substantial improvement (50% or more of market value).

After Hurricane Harvey, the City's Building Official assessed damage and issued two substantial damage letters and required consultation with City officials prior to initiating any repairs that required structures meet current building code, particularly with regards to flood risk mitigation. These two homes were elevated. There was no damage to any manufactured home in Alvin as they are required to be elevated before placement.

Storm Water Management: The City is actively involved in addressing storm water problems and applies requirements on new development to control increases in runoff. The City implements a comprehensive five-year Storm-water Management Plan based on the General Permit for storm-water discharge from Municipal Separate Storm Sewer System (MS4) issued by TCEQ. The City submits annual MS4 report to TCEQ regarding the status of the goals and objectives identified in the comprehensive plan. Small developments with little opportunity for on-site detention may be allowed to purchase capacity in the C & R #3's regional detention facilities.

High Wind Hazards

The City of Alvin is located in the area of the State in which the Texas Windstorm Insurance Association functions as the insurer of last resort for wind and hail coverage when other insurers exclude coverage for those perils from homeowners and other property policies. In order for new construction or modifications to existing structures to qualify, inspections must be performed by inspectors from the Texas Department of Insurance or licensed professional engineers who are

appointed by the Department. Several inspections may be performed to determine compliance with the wind provisions of the buildings code, and a certificate of compliance is issued.

Alvin addresses wind hazards through its building code and land use regulations:

- The building code administered by the City requires all new construction to be designed and constructed for 140 mile per hour wind loads at three second gusts. This level of protection has been part of the building code since 2018; thus buildings constructed after that date are expected to be resistant to damage from this wind strength.
- The Construction, Placement and Maintenance Ordinance (Sec. 171/2-40) requires that ground signs, and building signs that extend above the roof line, are to be designed, constructed and installed to withstand a wind pressure compliance with most current edition of the IBC and NEC Code adopted by the City.

Drought

The City of Alvin prepared and City Council adopted the 2019 updated drought contingency plan, which can be provided by request to any interested party. The purpose of the plan update is review the past plan and make updates or changes since that last iteration. The purpose of the plan is to conserve the available water supply and to protect the integrity of water supply facilities. The plan places emphasis on domestic water use, sanitation, and fire protection, and protection of public health, welfare, and safety. To minimize the adverse impacts of water supply shortage or other water supply emergency conditions, the City adopted regulations and restrictions on the delivery and consumption of water. Certain non-essential uses are regulated and may be curtailed during times of water shortage or other emergency water supply conditions. Violators may be assessed penalties.

Regulatory and Planning Recommendations to support City Mitigation Efforts:

While the City has many ordinances supporting hazard mitigation, the use of a single unified land development code is an advisable approach. A unified development code combines all land use controls into a single document with a logical structure that is friendly for its users.

While the City is in the NFIP, the City could further reduce flood insurance by applying to the Community Rating System, CRS.

Pursue open space preservation within adjacent development, dedication of conservation easements, or fee simple acquisition of land along Mustang Bayou to protect this natural resource from the impacts of urban development, including increased erosion and flooding, pollution of waters, and loss of natural protective barriers.

Financial Resources

The City receives sales and property taxes, utility fees and development impact fees to fund its operations. With those funds, the City creates an operating budget and a capital improvements budget.

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

In addition, the City actively pursues grants through various state and federal agencies for projects and programs, including hazard mitigation.

Insured City Buildings
The City maintains approximately $20,521,286 in property insurance coverage on buildings and facilities it owns, to protect the City from damage due to structural fire, wind and lightning (hazards other than flood). The City also carries approximately $871,852 in coverage for building contents.

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

Education and Outreach

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

The City of Alvin actively communicates with its residents using a variety of media, each of which have been used to convey information, including content about hazards. In addition to the emergency alert abilities mentioned in the Administrative and Technical section, the City also provides the following outreach and education to engage the public regarding hazards and related issues (i.e. storm water, street and drainage, new ordinances).

- News Releases - News releases announcing City events and issues of public interest are sent to local media help publicize information to the public.
- Website - The City's official website provides information, applications, forms, and interactive features such as maps.
- Special Events - The City of Alvin sponsors or cooperates in planning various special events, including ribbon cuttings and groundbreakings, legislative functions, and community outreach.
- Other Services include print pieces such as brochures (see Figure N), signage, and official City newsletters such as the Annual Hurricane Preparedness and quarterly reports prepared by the Engineering and Economic Development Departments.

Figure N - Example of an Alvin Public Notification for Flood Awareness – 2016

CITY OF ALVIN
Engineering Department
1100 West Highway 6 • Alvin, Texas 77511 • 281-388-4279 • FAX (281) 331-7516

City of Alvin
2016 Flood Awareness Update

1. **LOCAL FLOOD HAZARD** - The purpose of this notification is to inform you of flood hazards associated with our local drainage-ways (Mustang Bayou, Chocolate Bayou, etc.) and suggest possible actions you can take to protect yourself.

Alvin has a long history of flooding. In addition to our normal rainfall, we are often inundated by rain from Tropical Depressions, Storms, and Hurricanes. Some of the most devastating events include:

- 1961 – Hurricane Carla flooded 402 square miles of Brazoria County and caused over $75 Million dollars in damage.
- 1979 – Alvin recorded the greatest 24-hour rainfall in the United States, with 43 inches of rain.
- 2001 – Tropical Storm Allison produced 27 inches of rain and produced widespread damage in the City.

The City of Alvin has FEMA maps that designate flood zones within the city. The maps are available for viewing anytime on our website @ http://www.alvin-tx.gov/ , or from 7:00 a.m. to 6:00 p.m. Monday – Thursday in the Community Development Department at 1100 West Highway 6, Alvin, Texas 77511. Additionally, if you would like a flood zone determination, you can come by or call 281-388-4279.

2. **FLOOD SAFETY** - Flooding can occur with little warning. In order to mitigate the hazards of flooding:

- Know the flood warning procedures.
- Plan escape routes to high ground.
- During heavy rainfall, monitor the level of water in the drainage-way. Stay tuned to radio or TV for possible flood warnings.
- Evacuate the flood hazard area in times of impending flood or when advised to do so by the police or fire departments.
- Do not attempt to cross a flooding stream on foot or by car.
- Remember TADD - Turn Around, Don't Drown!
- If your car stalls in high water, abandon it immediately and seek higher ground.
- Stay away from power lines and electrical wires.
- Keep children away from flood waters, ditches, culverts and storm drains.

3. **FLOOD INSURANCE** - Your homeowner's insurance policy will not cover losses due to flooding. Alvin participates in the National Flood Insurance Program, which makes flood insurance available to everyone in the City. For many people, their home and its contents represent their greatest investment. *We strongly urge you to buy flood insurance to help protect yourself from devastating losses due to flooding.* Information about flood insurance can be obtained from your insurance agent. You do not have to live in the floodplain to qualify for flood insurance. Property owners can insure their buildings and contents and renters can insure their possessions. Just because your house hasn't flooded in the past doesn't mean it won't in the future. *There is a 30-day waiting period before a flood insurance policy takes effect, so you should call your insurance agent now to find out more.*

4. **PROPERTY PROTECTION MEASURES** - Methods are available for retrofitting flood prone property such as flood protection levees, elevating existing structures and protection barriers. Literature is available at the City of Alvin Public Library from FEMA regarding retrofitting. Emergency measures that can be taken to minimize damage are also explained – including moving furniture and sand bagging.

5. **NATURAL AND BENEFICIAL FUNCTIONS** - The term "floodplain" often carries a negative connotation because of past experiences with flooding; however, the natural characteristics of a floodplain provide beneficial functions as well. Floodplains serve to protect the value of our water resources, living resources, and cultural resources. They also protect natural flood storage and provide conveyance, water quality maintenance, and groundwater recharge. In our creeks in Alvin, they also provide for breeding, nursery, and feeding grounds for fish and wildlife, as well as a source of nutrients for nearby wetlands.

6. **MAP OF THE LOCAL FLOOD HAZARD** - The Flood Insurance Rate Map (FIRM) shows the 100-year floodplain (AE), the 500-year floodplain (Shaded X), and areas outside of the designated floodplain (Unshaded X). It is available for viewing on the City's website at http://www.alvin-tx.gov/ under Floodplain Information. The 100-year floodplain is the area that is prone to flooding and has a 1% chance of being flooded in any given year. The 500-year floodplain is the area that is prone to flooding with a 0.2% chance of being flooded in any given year. Smaller floods have a greater chance of occurring in any year and can still create a significant flood hazard to people and property close to the creeks.

7. **FLOOD WARNING SYSTEM** - The City of Alvin has the following programs in operation in the event of a major flooding event: The Mayor, Police and Fire Departments use **CTY Connect**, a telephone and email-based warning system to provide flood warnings. Also, KTRH and KPRC provide current weather information for the Alvin Area.

8. **FLOODPLAIN DEVELOPMENT PERMITS** - The City of Alvin has a Flood Damage Prevention Ordinance that requires a Development Permit for building, excavation, filling, paving, grading, or otherwise developing in the floodplain. A Development Permit submittal must contain a Grading Plan. The Grading Plan must show existing topographic information, all proposed development work, and be signed and sealed by a registered Professional Engineer. Contact the Permits Department or visit our website at http://www.alvin-tx.gov/ prior to any such development to obtain permits and information. Citizens should also report any illegal floodplain development to our office at 281-388-4282.

9. **SUBSTANTIAL DAMAGE, SUBSTANTIAL IMPROVEMENT** - Per the City's Flood Damage Prevention Ordinance:

- *Substantial Damage* means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50% of the market value of the structure before damage occurred.
- *Substantial Improvement* means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure either before the improvement or repair is started, or if the structure has been damaged and is being restored, before the damage occurred.

New construction and Substantial Improvements shall be constructed in compliance with the City's Flood Damage Prevention Ordinance or be subject to a fine not exceeding $2,000 per day per violation.

10. **DRAINAGE SYSTEM MAINTENANCE** - The City of Alvin, Brazoria County, Brazoria County Conservation and Reclamation District #3, Brazoria County Drainage District #4, and Brazoria County Drainage District #5 all have jurisdiction within the City of Alvin and provide regular maintenance to all of the drainage ways. Citizens should report any debris or blockages to the appropriate agency for removal. Keeping the drainage-ways clear in the event of a flood can help minimize potential damage.

City of Alvin Street Department	281-388-4253
Brazoria County Conservation and Reclamation District #3 http://bcrd3.com/CMS/	281-331-3433
Brazoria County Drainage District #4 http://www.pearland-drainage.dst.tx.us/	281-485-1434
Brazoria County Drainage District #5 http://www.bcdd5.com/	281-369-0071
Brazoria County Engineering Department http://www.brazoria-county.com/engineer/index.asp	979-864-1266

11. **OTHER INFORMATION**

Federal Emergency Management Agency	www.fema.gov
Texas Department of Emergency Management	www.txdps.state.tx.us

In addition to all of these methods to engage the public, the City also utilizes:

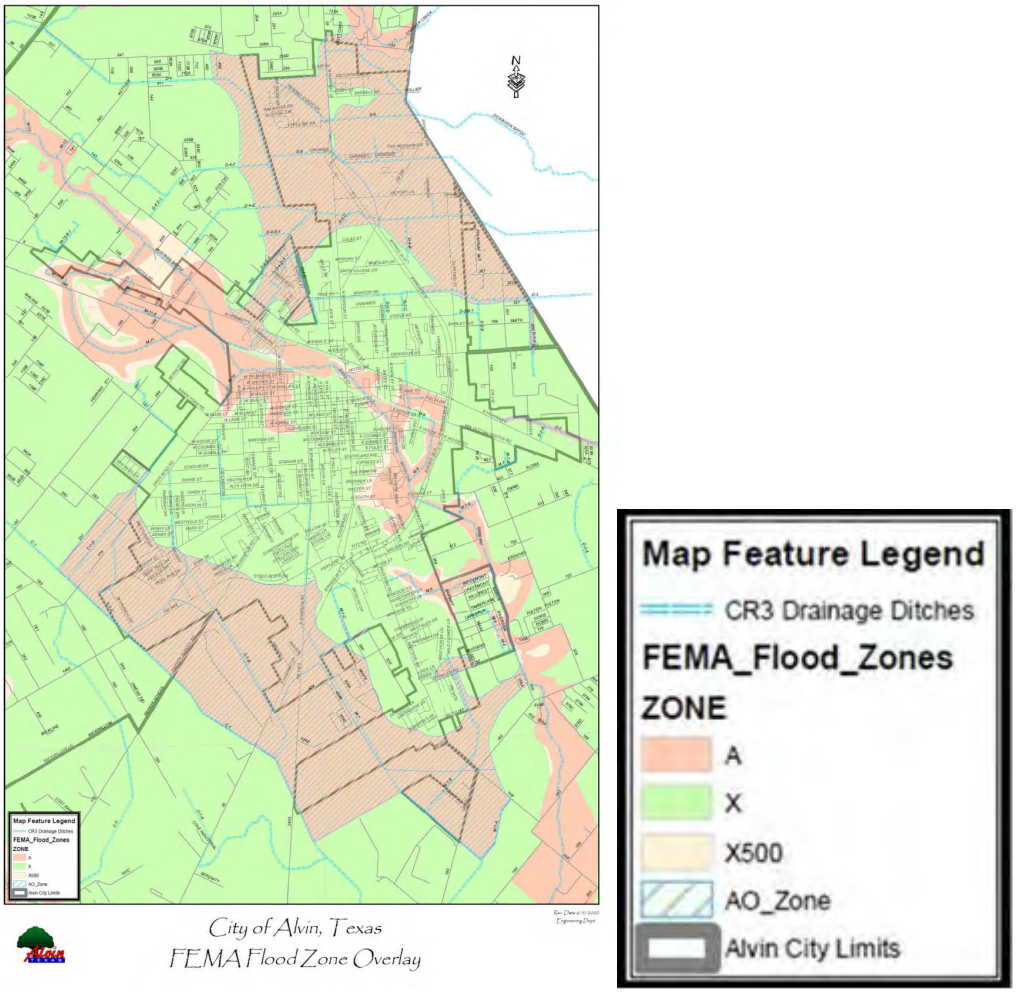
- Everbridge and Blackboard Connect allows officials to disseminate messages to those residents and businesses who have registered to receive emergency notification through a single telephone call, text message, or email.
- Engineering department answers all of the resident's inquiries related to drainage, floodplain, and FEMA FIRM.
- GIS provides for interactive mapping features to allow user to map based on individual query.

Education and Outreach Recommendation to support Mitigation Efforts: Support an awareness campaign about the hazards in the schools and senior center.

Review of The City of Alvin's Participation in National Flood Insurance Program (NFIP)
Participation with NFIP is important to the City of Alvin and for more than 2,217 NFIP insured building owners who carry flood insurance. This is evidenced by the City's commitment to regulating development and redevelopment, its adoption of provisions that exceed the minimum requirements, and by its active pursuit of risk mitigation opportunities. The City is firmly committed to continued compliance with the NFIP. The City Engineer is designated as the Floodplain Administrator for the City.

Upon issuance and final approval of the Flood Insurance Rate Map (FIRM) in July 1987, the City joined the NFIP Regular Program. The effective FIRM for Alvin can be found on the City's website. Figure O is the flood map for Alvin.

FIGURE O - ALVIN FLOOD MAP



Prior Actions Related to NFIP Compliance

Regulations Review

In August, 2010, the City of Alvin passed an ordinance amending the Flood Damage Prevention ordinance, by adding a 1 foot freeboard requirement for mechanical equipment and preventing the construction of building enclosures in a floodplain. The process continues to be reviewed with the most recent changes in 2019. On December 5, 2019, after the Community Assistance Visit (CAV-see below) with the Texas Water Development Board (TWDB), it was recommended that the City make two minor revisions to Appendix A Flood Damage Prevention which is the ordinance that governs development within the floodplain. The revisions were:

- Article 3, Section G: Update the section title to "Warning and Disclaimer of Liability:
- Article 4, Section B(6): Update the Coordinating Agency to the TWDB.

Both changes were approved by Council and Ordinance 19-CC amending Appendix A, Flood Damage Prevention were updated.

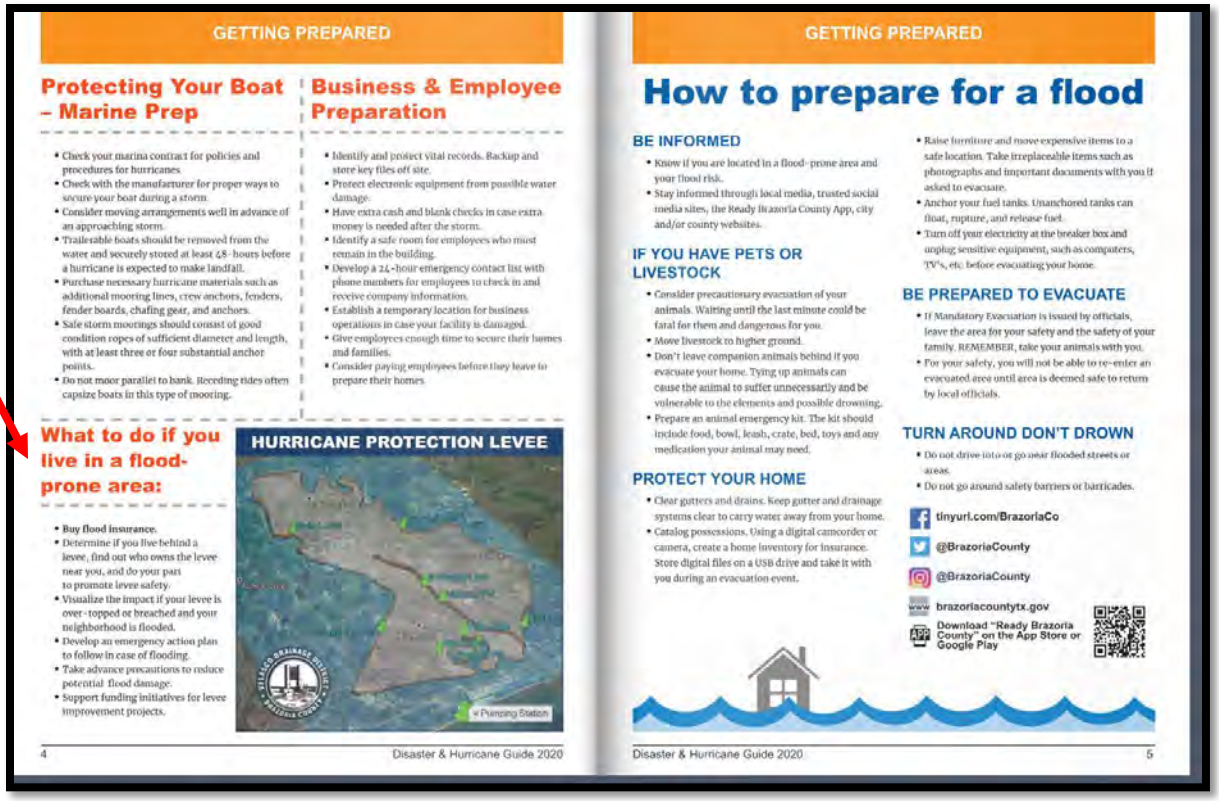
The City has FEMA maps that designate flood zones within the City. The City also maintains a GIS system that can help residents determine if their properties are located in or out of floodplain. One example is the City of Alvin passed a Flood Damage Prevention Ordinance that requires a development permit for building, excavation, filling, paving, grading or otherwise developing in the floodplain. A development permit must contain a grading plan. The grading plan must show existing topographic information, all proposed development work and be signed and sealed by a registered Engineer.

Continued NFIP Compliance

This previous subsection describes actions the City is currently undertaking to ensure continued compliance with the NFIP. The 2020 MPC identified, reviewed, and prioritized the NFIP actions. The prioritized NFIP actions are listed below:

- Applying for CRS.
- Review and analyze existing floodplain regulations for opportunities to reduce flood damages through adoption and enforcement of new regulations.
- Periodic review of the City Building Code, Floodplain and Land Use Ordinances.
- Periodic review and update of Engineering Design Criteria Manual, and Flood Damage Ordinance.
- Continuously work with FEMA to update and adopt the latest FIRM and require Elevation certificate, CLOMR, LOMR for future development with the FEMA mapped floodplain.
- Continue to inform citizens who live in flood-prone areas to buy and maintain flood insurance as demonstrated in the annual Hurricane and Disaster Preparedness Brochure that is sent out to homeowners and on the City's website. Figure P is a page from the March 2020 brochure. The red arrow on the next page indicates the recommendation to homeowners to Buy Flood Insurance.

Figure P – Hurricane and Disaster Preparedness Brochure, Section on What to do if you live in a Flood-prone Area



GETTING PREPARED

Protecting Your Boat – Marine Prep

- Check your marina contract for policies and procedures for hurricanes
- Check with the manufacturer for proper ways to secure your boat during a storm.
- Consider moving arrangements well in advance of an approaching storm.
- Trailerable boats should be removed from the water and securely stored at least 48-hours before a hurricane is expected to make landfall.
- Purchase necessary hurricane materials such as additional mooring lines, crew anchors, fenders, fender boards, chafing gear, and anchors.
- Safe storm moorings should consist of good condition ropes of sufficient diameter and length, with at least three or four substantial anchor points.
- Do not moor parallel to bank. Receding tides often capsize boats in this type of mooring.

Business & Employee Preparation

- Identify and protect vital records. Backup and store key files off site.
- Protect electronic equipment from possible water damage.
- Have extra cash and blank checks in case extra money is needed after the storm.
- Identify a safe room for employees who must remain in the building.
- Develop a 24-hour emergency contact list with phone numbers for employees to check in and receive company information.
- Establish a temporary location for business operations in case your facility is damaged.
- Give employees enough time to secure their homes and families.
- Consider paying employees before they leave to prepare their homes.

What to do if you live in a flood-prone area:

- Buy flood insurance.
- Determine if you live behind a levee, find out who owns the levee near you, and do your part to promote levee safety.
- Visualize the impact if your levee is over-topped or breached and your neighborhood is flooded.
- Develop an emergency action plan to follow in case of flooding.
- Take advance precautions to reduce potential flood damage.
- Support funding initiatives for levee improvement projects.

HURRICANE PROTECTION LEVEE

Pumping Station

4 Disaster & Hurricane Guide 2020

GETTING PREPARED

How to prepare for a flood

BE INFORMED

- Know if you are located in a flood-prone area and your flood risk.
- Stay informed through local media, trusted social media sites, the Ready Brazoria County App, city and/or county websites.

IF YOU HAVE PETS OR LIVESTOCK

- Consider precautionary evacuation of your animals. Waiting until the last minute could be fatal for them and dangerous for you.
- Move livestock to higher ground.
- Don't leave companion animals behind if you evacuate your home. Tying up animals can cause the animal to suffer unnecessarily and be vulnerable to the elements and possible drowning.
- Prepare an animal emergency kit. The kit should include food, bowl, leash, crate, bed, toys and any medication your animal may need.

PROTECT YOUR HOME

- Clear gutters and drains. Keep gutter and drainage systems clear to carry water away from your home.
- Catalog possessions. Using a digital camcorder or camera, create a home inventory for insurance. Store digital files on a USB drive and take it with you during an evacuation event.
- Raise furniture and move expensive items to a safe location. Take irreplaceable items such as photographs and important documents with you if asked to evacuate.
- Anchor your fuel tanks. Unanchored tanks can float, rupture, and release fuel.
- Turn off your electricity at the breaker box and unplug sensitive equipment, such as computers, TV's, etc. before evacuating your home.

BE PREPARED TO EVACUATE

- If Mandatory Evacuation is issued by officials, leave the area for your safety and the safety of your family. REMEMBER, take your animals with you.
- For your safety, you will not be able to re-enter an evacuated area until area is deemed safe to return by local officials.

TURN AROUND DON'T DROWN

- Do not drive into or go near flooded streets or areas.
- Do not go around safety barriers or barricades.

tinyurl.com/BrazoriaCo
@BrazoriaCounty
@BrazoriaCounty
brazoriacountytx.gov
Download "Ready Brazoria County" on the App Store or Google Play

Disaster & Hurricane Guide 2020 5

Community Rating System Participation

The Federal Emergency Management Agency's (FEMA) National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed NFIP requirements. CRS offers discounts on the cost of federal flood insurance to those citizens who reside within recognized communities. The City has a part of action with this update, plans to apply for CRS.

Community Assistance Visit

When a community joins the NFIP, federally-subsidized flood insurance is made available to the citizens in exchange for any new development or substantial improvements of structures in the floodplain meeting minimum NFIP compliance standards. The State, through the Texas Water Development Board periodically conducts Community Assistance Visits (CAV) to review the City's floodplain practices to determine their effectiveness. The most recent CAV visit was completed on October 17, 2019 and was issued a close out letter with no suggestions for improvement, a recommendation for slight update to the floodplain ordinance and a recommendation for the City to apply for CRS.

Harvey and Aftermath

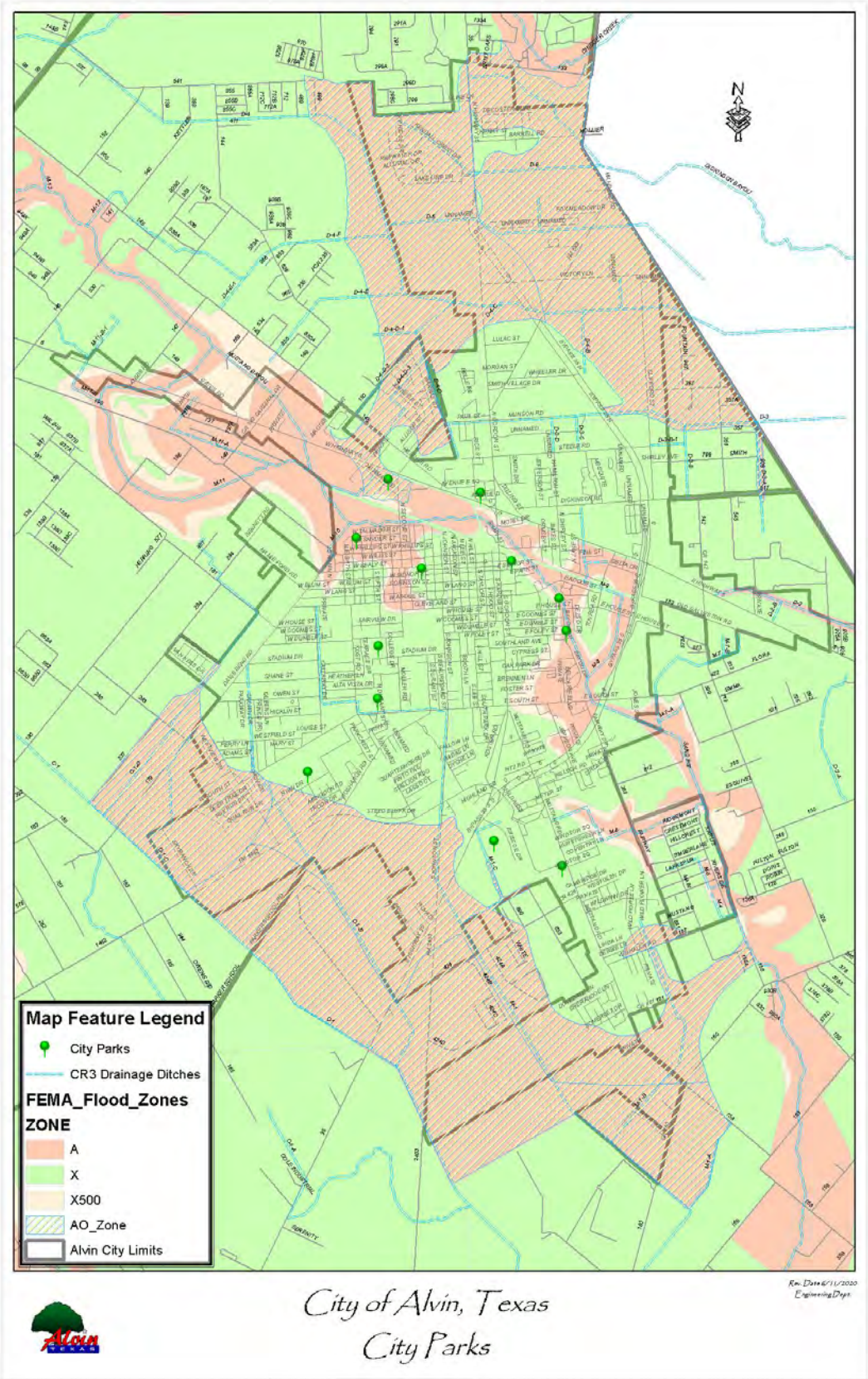
As a result of Hurricane Harvey in 2017, the City of Alvin sustained damages to four (4) City buildings, City owned vehicles, City equipment, and Park facilities, and had reimbursable expenses for debris removal and emergency protective measures, totaling approximately $998,000.00. In addition over four hundred homes sustained flood damage with roughly half of those homes holding flood insurance.

Capabilities to Support Natural Resources
The City of Alvin values its open space and encourages protection of trees and wetlands in its development processes. The approval process for subdivisions within the City and the area designated as the extra-territorial jurisdiction requires developers to delineate waterways, drainage structures, the boundaries of flood-prone areas (including floodways).

Open Space. In addition to the 12 parks that are maintained by the City's Parks and Recreation Department (see Figure Q - City of Alvin - Park Locations), the City requires that new development include open space/green space plans including hike and bike trails, parks and sports fields other green space amenities.

Tree Preservation: In 2017, the City added a new article, "Tree Preservation" to Chapter 15 Offenses and Miscellaneous Provisions of the City of Alvin Code of Ordinances, relating to the preservation of trees within the territorial limits of the City; providing for a penalty; providing for severability; providing for repeal; providing for an effective date; and related matters. It established a tree fund, where all revenues and penalties received pursuant to this section, or for the enforcement thereof, and any donations or grant monies received to achieve the purpose of tree preservation or replacement, shall be deposited into the tree fund.

Figure Q - City of Alvin - Park locations



SECTION 3 – HAZARD IDENTIFICATION AND RISK ASSESSMENT

Introduction

Risk assessments are conducted to determine the potential impacts of specified hazards on human safety, the Alvin 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 R) 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 2015 plan. Hazards are then evaluated on the basis of potential impact on the community, the community's overall vulnerability and the most significant risks.

Update from the Last Plan

For the original Plan, the MPC considered all potential hazards that may affect the City of Alvin. As part of the update process, the MPC reviewed the hazards included as part of the 2015 Plan and determined that the following hazards would be addressed in the Plan update. The hazards are floods, tornadoes, thunderstorms/high wind, hurricanes and tropical storms, droughts, extreme heat, hail and winter storm. 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.

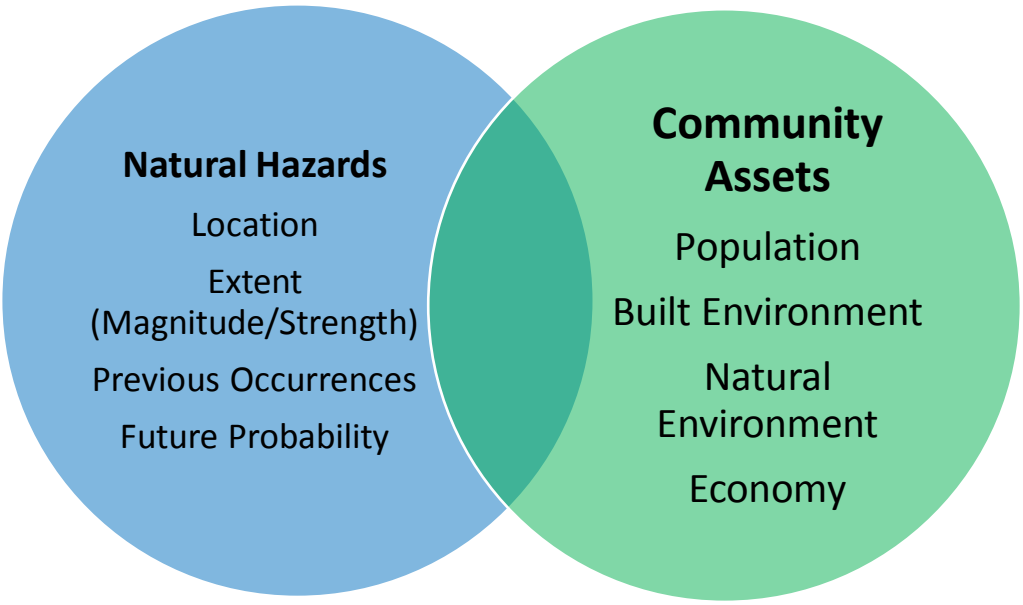
After reviewing all hazards that could potentially impact Alvin, the MPC considered the flood hazard the most significant. In addition, while lightning does occur in the planning area, through existing measures already taken, the MPC has successfully mitigated this hazard to the best of the community's capability. Therefore, it will not be included. In addition, two hazards, after further review and study of recent (last five years) and long-term history demonstrated that the dam failure and wildfires are not hazards that occur in the area and therefore omitted. Further discussion of the omission is below. The hazards addressed in this subsection found in Table 3-1 include the following:

Table 3-1 – Alvin 2015 Hazards and 2020 Hazards

Alvin 2015 Hazards	2020 Hazards Reviewed	2020 Hazards for Plan
Flood	**Flood**	**Flood**
Tornadoes	**Tornadoes**	**Tornadoes**
Severe Thunderstorms/High Wind	**Thunderstorms – High Wind**	**Thunderstorms – High Wind**
Coastal Storms (Hurricane/Tropical Storms)	**Hurricanes and Tropical Storms**	**Hurricanes and Tropical Storms**
Winter Storm	**Winter Storm**	**Winter Storm**
Wildfire	**Wildfire**	**Omitted**
Dam Failure	**Dam Failure**	**Omitted**

Alvin 2015 Hazards	2020 Hazards Reviewed	2020 Hazards for Plan
Drought	**Drought**	**Drought**
Extreme Heat	**Extreme Heat**	**Extreme Heat**
Hail	**Hail**	**Hail**
	Lightning	**Mitigated - Omitted**

Figure R - FEMA Concept of Risk Diagram



Overview of Risks

Table 3-2 identifies the total number and estimated value of buildings/infrastructure within Alvin. The table indicates there are 6,883 residential buildings and 895 commercial buildings in the City. 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 3-2 is used periodically throughout this plan update to identify the overall exposure within Alvin for certain hazards that equally impact the entire planning area such as hurricanes/tropical storms and drought.

Table 3-2 – City of Alvin Structures

Type	No. of Structures
Residential Buildings	6,883
Commercial Buildings	895
Public Buildings/Infrastructure	123

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 Alvin.

The City 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 City has decided to omit these hazards. Important to note, while the City 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. The City updates the profile for each hazard and if the results of the review are negligible impact, the City removes the hazard. As part of the appendix, to this plan update and as example of the review, the City has included a profile completed for one of the hazards omitted, earthquakes, so it can illustrate the process of the omission based on the profile result. The following table (3-3) will provide a brief explanation on each hazard that the City considered negligible impact and will not profile and be omitted from the plan update. The only hazard that does occur, lightning, there are no additional mitigation measures for the City to take and therefore it is considered mitigated.

Table 3-3 – Hazards considered in Alvin Plan Update and Reason for Omission

Hazard Considered	Reason for Omission
Earthquakes	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.
Expansive soils	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.
Landslide	Given that there is no recorded landslides in Alvin and the USGS study indicate is less than 1.5% chance the area will be involved in a landslide, there is less than 1th than 1% chance of a future occurrence making future occurrence very rare. Therefore, the hazard is negligible and will not be profiled.
Dam Failure	The City of Alvin does not have any dams located within its limits. Most of the planning area is located in Brazoria County. The U.S. Army Corp of Engineers (USACE) maintains a National Inventory of Dams (NID), and reports that there are 56 dams in Brazoria County of which 6 are classified as a high hazard, 14 are classified as a significant hazard and 36 are classified as a low hazard. There are no dams located in Alvin and all the dams in Brazoria County are south of Alvin. Since the City of Alvin does not have any dams and is not immediately downstream from any significant dams, the impact is negligible.

Hazard Considered	Reason for Omission
Lightning	Mitigated: The City of Alvin does have lightning occurrences, but when lightning does happen the City is protected to the best of their abilities. The City has lightning protection devices on critical facilities; lightning rods and grounding on communication buildings; surge protection on all buildings and education brochures online and available to the public.
Wildfire	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 City and future occurrences are expected to be extremely low.

Through the profile process, for the hazards that affect the hazard area, the NCEI database indicates that, as of the first quarter of 2020, over time these hazard events caused a combined total of approximately $3.77 billion in property damage in Brazoria County. The database also indicates that there have been 73 personal injuries and 6 fatalities as a result of these events (see Table 3-4). Using the FEMA BCA guidance, the estimated loss for those fatalities is approximately $34.8 million; not including personal injury and lost time costs, which would increase costs. While this is County data, it is consistent with the hazards that the City of Alvin considers likely and impactful.

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

Injuries from 1950-2015	70
Injuries from 2016-2020	3
Total Injuries	73
Death from 1950-2015	4
Deaths from 2016-2020	2
Total Deaths	6
Property Damages from 1950-2015	$1.775 B
Property Damages from 2016-2020	$2.002 B
Total Property Damages	$3.777 B

The Hazard Summary table 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. Definitions for classifications are below using FEMA's Hazard Summary Worksheet. The likelihood of a hazard occurring is categorized as Unlikely, Occasional, Likely, or Highly Likely based on historical data and, in the absence of historical data, estimates. This table was reviewed and edited as part of the Plan Update.

Note that various qualitative terms are used to describe the probabilities of hazards in this section. The potential events described in this section are related to natural phenomena such as the weather

and movement of the earth. Because of this, there is significant variability over time, so in some cases it is necessary to use relative terms such as "likely" and "unlikely" to fairly characterize their probability. "Highly unlikely" means less than a 1% chance of occurrence annually. The term "unlikely" means up to a 10% chance annually. "Occasionally" means up to a 25% chance annually. "Likely" means 35% to 50% annual chance of occurrence, and the term "very likely" means that the event(s) are assumed to occur at least annually. All these terms refer to the entire planning area, except where text specifies otherwise.

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.

Table 3-5 Hazard Summary

Hazard Type	Maximum Probable Event	Likelihood of Occurrence	Overall Significance
Drought	Severe	Likely	Low
Extreme heat	Moderate/Severe	Likely	Medium/High
Flooding/flash flooding	Severe	Occasional	Medium/High
Hurricane/tropical storm	Severe	Likely	High
Tornado	Moderate/Severe	Occasional	Low
Severe Wind	Moderate	Highly likely	Low
Severe Winter Weather	Weak	Likely	Low
Hail	Weak	Likely	Low

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 and the Natural Resources Conservation Service collect data on losses during the course of some of their ongoing projects and studies. As mentioned earlier in this Section, NOAA's 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 City of Alvin, 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 Alvin, illustrative examples are useful. Table 3-6 lists by incident type and year particularly significant natural hazard events occurring in the City's recent history.

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 Brazoria County affected the City of Alvin. However, as of 2020, 15 such disasters had been declared in Brazoria County and are identified as part of the summary in Table below including 4 since the last plan update. Declared disasters that directly affected Alvin are noted.

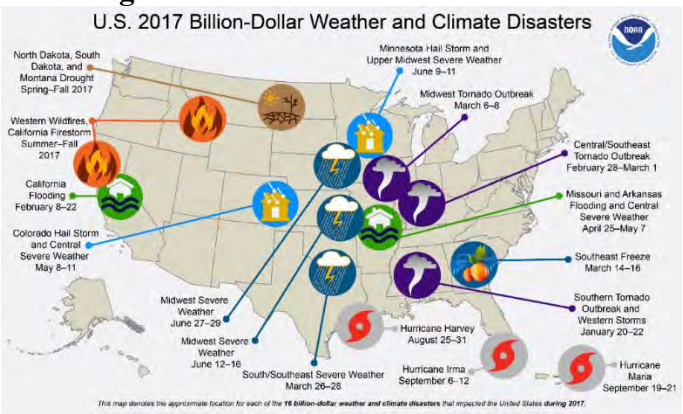
Table 3-6 - Natural Hazard Events and Declared Major Disasters in Brazoria County (Sources: FEMA, NCEI database)

Year	Declaration Number	Incident Type
1980	DR-627	Hurricane
1983	DR-689	Hurricane
1991	DR-900	Flood
1991	DR-930	Flood
1994	DR-1041	Flood
1998	DR-1257	Flood
1998	DR-1245	Tropical Storm
2001	DR-1379	Tropical Storm
2002	DR-1439	Severe Storms, Tornadoes
2002	DR-1434	Tropical Storm
2003	DR-1479	Hurricane
2005	DR-1606	Hurricane
2008	DR-1791	Hurricane
2015	DR-4223	Severe Storms, Tornadoes, Straight-line Winds, and Flooding
2015	DR-4245	Severe Storms, Tornadoes, Straight-line Winds, and Flooding
2016	DR-4272	Severe Storms and Flooding
2017	DR-4332	Hurricane

Losses Due to Major Disasters

The United States has experienced 219 weather and or climate-related disasters since 1980. Although no definitive record exists of all public and private losses due to disasters in Alvin, 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 2017) is available. The total cost of these 219 disasters exceeds $1.5 trillion (NCEI), with 2017 being the most disastrous year on record. The NCEI reports that there were 16 weather-related disasters in 2017 including 1 drought event, 2 flooding events, 1 freeze event, 8 severe storm events, 3 tropical cyclone events, and 1 wildfire event. Overall, these events resulted in 362 fatalities (using FEMA guidance is approximately $2.1 billion) and had significant economic effects on the areas impacted. The illustration (Figure S) below depicts the timing and location of these disasters.

Figure S - 2017 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.

The City of Alvin has experienced numerous disasters and has actively applied for and administered various grants over the years. Below is a list of grants by year that the City has been awarded since the last version of the Plan:

2020:
General Land Office Grant (continued from 2019) – City of Alvin's grant award is $1,012,332 and is intended to install generators to facilitate the proper functioning of critical wastewater system, water system and public facility components to reduce the impact of sewage contamination and backflow and ensure optimum water service in emergency situations.

Emergency Management Performance Grant (EMPG) – personnel costs for emergency management needs up to $40,000 per year

Rebuild Taxes Grant – to purchase and install a backup radio communications network and portable handheld radios for public safety departments. The amount was $21,999.

Coronavirus Relief Fund (CRF) through the Coronavirus AID, Relief, Economic Security (CARES) Act – to assist with public health emergency needs. The total amount that the City of Alvin was allocated is $1,549,845. However, the City is not required to use the total amount and may transfer any unused amounts to another qualifying agency.

2019:
General Land Office Grant – City of Alvin's grant award is $1,012,332 and is intended to install generators to facilitate the proper functioning of critical wastewater system, water system and public facility components to reduce the impact of sewage contamination and backflow and ensure optimum water service in emergency situations.

Emergency Management Performance Grant (EMPG) – personnel costs for emergency management needs up to $40,000 per year

2015:
General Land Office –
2.1 – Hurricane Ike/Dolly recovery, generators at wells 3 & 7 ($235,339) and the water SCADA system ($477,034)
2.2 - 18,000 feet of sanitary sewer rehab ($1,759,130)

Texas Water Development Board – Flood Mitigation Assistance Program – buyout of 2 homes due to severe repetitive loses $226,671

Impacts of Hurricane Harvey on Alvin

As a result of Hurricane Harvey in 2017, the City of Alvin sustained damages to four (4) City buildings, City owned vehicles, City equipment, and Park facilities, and had reimbursable expenses for debris removal and emergency protective measures, totaling approximately $998,000.

The City continues to work diligently to mitigate hazards to its residents and business community. The identification of hazards, however, is the start of a process to understand what hazard mitigation actions could be undertaken to reduce future risk to the residents of Alvin and its business community.

The City reviewed the State Hazard Mitigation Plan, the National Oceanic and Atmospheric Administration's National Centers for Environmental Information (NOAA, NCEI), FEMA's Disaster Declarations, the US Army Corp of Engineers National Inventory of Dams, the Harris County Flood Control District's flood warning system website database and Texas A&M Forest Service, Texas Wildfire Risk Assessment (TX WRAP). These reports were used in this plan update as follows:

- State Hazard Mitigation Plan: Plan's goals, actions and hazards were reviewed to gather data for this plan for mitigation strategy, goals, actions and hazard data.
- National Oceanic and Atmospheric Administration's National Centers for Environmental Information (NOAA, NCEI): Information used to gather hazard data.
- FEMA Disaster Declarations: Information was used for historical information and for hazard data.
- USACE National Inventory of Dams: Review of the database to determine locations, size and other relevant information to prepare a review of the hazard
- Harris County Flood Control District's Flood Warning System Database: Database was queried to provide historical and real time hazard data.
- Harris County Hazard Mitigation Plan Update: Plan's goals, actions and hazards were reviewed to gather data for this plan.
- Brazoria County Hazard Mitigation Plan Update: Plan's goals, actions and hazards were reviewed to gather data for this plan.
- Brazoria Drainage District No. 4 Hazard Mitigation Plan: Plan's goals, actions and hazards were reviewed to gather data for this plan.
- Texas A&M Forest Service Texas Wildfire Assessment: Report was reviewed to gather hazard data and to determine if hazard impacts area.

The next part of this section focuses on hazard identification, the potential impact of these hazards and the community's vulnerability from each hazard.

Drought
Update from Last Plan

- Events since 2015, were updated and described.
- Information on the Drought Impact Reporter (DIR) added.
- 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
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.

Location-Drought
Brazoria County is susceptible to all ranges of drought as defined by the Palmer Drought Severity Index (see Extent) and since drought occurs on regional scale, all of the Alvin is equally at risk as it can occur anywhere in the jurisdiction.

Previous Occurrence
According to the NCEI database, Brazoria County, including the planning area, has experienced nine drought events in the period from 1996 to 2020. All nine events occurred between 1996 and 2000. The database provides no records of drought events prior to 1996, although presumably occurrences follow the same pattern and frequency as shown in the NCEI list. Also note that the 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 nine to three events. The NOAA Storm Events Database documents 9 drought events for Brazoria County since the year 1996 see Table 3-7.

Table 3-7 - Drought Events in Brazoria County, 1950 - 2020
(Source: NOAA/NCEI)

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	04/01/1996	12:00 AM	Drought	N/A	0	0	0	0
2 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	05/01/1996	12:00 AM	Drought	N/A	0	0	0	0
3 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	06/01/1996	12:00 AM	Drought	N/A	0	0	0	0
4 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	05/01/1998	12:00 AM	Drought	N/A	0	0	0	0
5 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	06/01/1998	12:00 AM	Drought	N/A	0	0	0	0
6 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	07/01/1998	12:00 AM	Drought	N/A	0	0	0	0
7 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	08/01/1998	12:00 AM	Drought	N/A	0	0	23.0M	167.9M
8 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	08/01/2000	12:01 AM	Drought	N/A	0	0	0	0
9 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	09/01/2000	12:00 AM	Drought	N/A	0	0	0	102.3M
				TOTALS:	0	0	23.000M	270.200M

The database did not include reports of other well-known droughts. Review of various other sources indicates that severe droughts in southeastern Texas, including Brazoria County have also occurred between 1950-1957, 2006, and 2007 – 2009. The most recent severe drought occurred between 2007 and 2009. The head of the Department for Soil and Crop Sciences at Texas A&M indicated that this drought was considered one of the worst dry spells to impact the State since the 1950's. For nearly two years, Texas suffered through one of the worst droughts in State history. According to the Lower Colorado River Authority (LCRA) meteorologist, when taking the entire period since the summer of 2007 into consideration, this drought was more intense than the 1950s. The area also experienced droughts in 2011, 2012 and 2013 that impacted Alvin. The U.S. Drought Monitor indicates that 99% of the State was suffering at least "severe" drought conditions during the drought beginning in 2011;

as indicated in a *The Houston Chronicle* news article, which indicated that the drought period extended from 2011-2013 and was one of the worst on record for the State (Berger, 2013).

Future Occurrence
Based on 10 years (1996, 1998, 2000, 2006, 2007, 2008, 2009, 2011, 2012 and 2013) of drought events within 24 years, a drought occurs approximately once every 2.4 years on average in Brazoria County and since droughts occur at a regional level, Alvin can expect a drought event approximately once every 2 and a half years or a 41.6% chance annually.

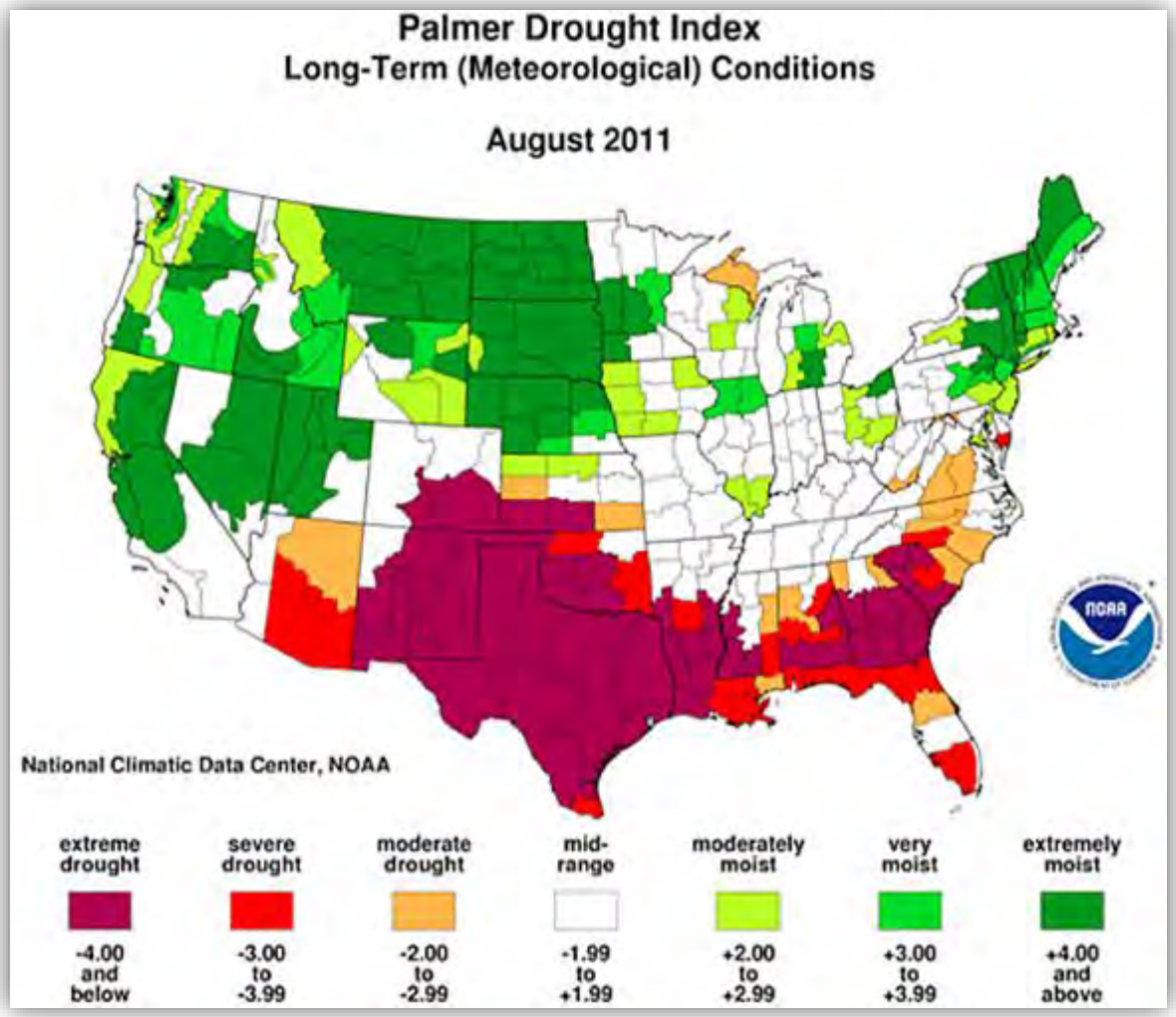
Magnitude/Extent
In 1965, W.C. Palmer developed an index to measure the departure of the moisture supply, called the Palmer Drought Severity Index (PDSI). The PDSI indicates the prolonged and abnormal moisture deficiency or excess and general conditions, not local variations caused by isolated rain. The PDSI is an important climatological tool for evaluating the scope, severity, and frequency of prolonged periods of abnormally dry or wet weather. Figure T shows the National Palmer Drought Severity Index (long-term). The graphic clearly depicts most of Texas being in a very severe drought (PDSI - 4.0). Since the last version of the Plan, the planning area was in the near normal to very most range, with one month being recorded as extremely moist, but never hitting a moderate drought or worse.

The equation for the PDSI was empirically derived from the monthly temperature and precipitation scenarios of 13 instances of extreme drought in western Kansas and central Iowa and by assigning an index value of -4 for these cases. Conversely, a +4 represents extremely wet conditions. From these values, seven categories of wet and dry conditions can be defined. Table 3-8 identifies the values used to define the PDSI. During the 2011 event the PDSI was -4.0. The City, Brazoria County and the State can expect to experience continued exposure to the full range of drought conditions expressed by the PDSI.

Table 3-8 - Palmer Drought Severity Index
(Source: NOAA, National Weather Service - Climate Prediction Center)

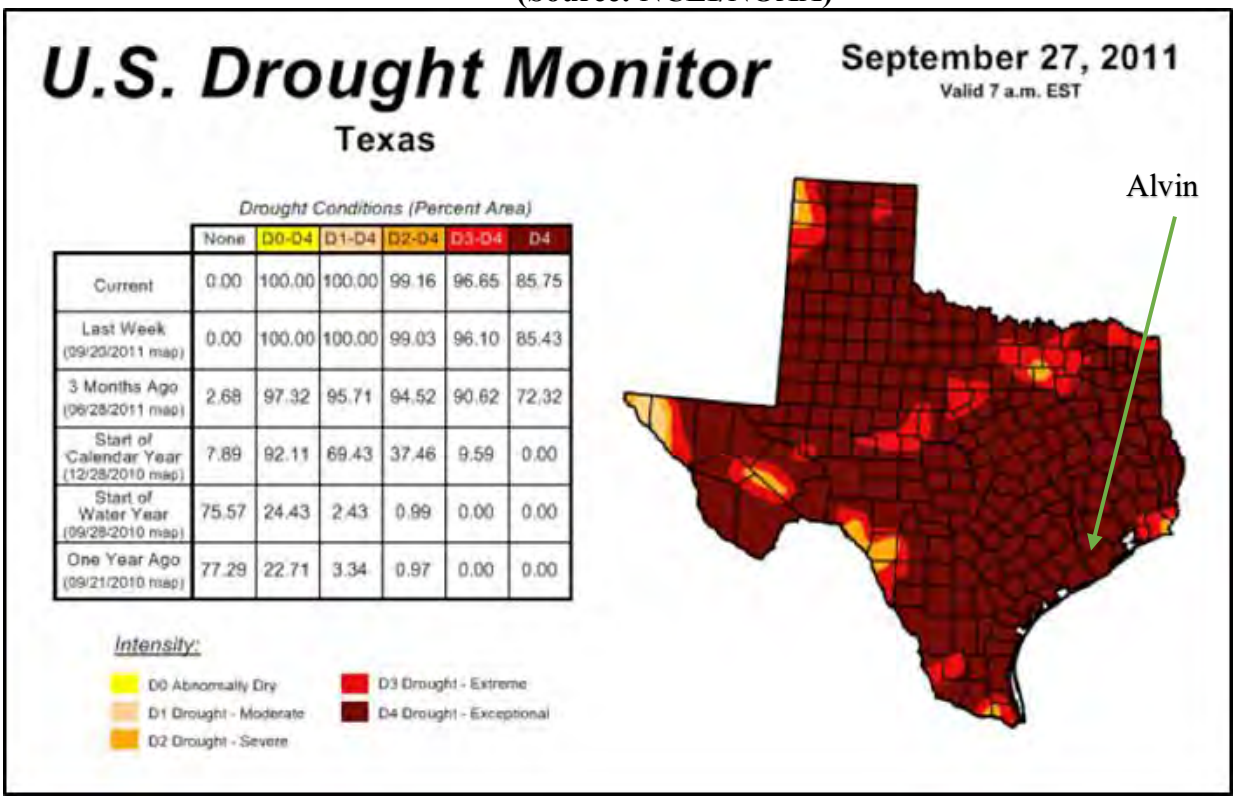
Palmer Drought Severity Index
-4.0 or less (Extreme Drought)
-3.0 or -3.9 (Severe Drought)
-2.0 or -2.9 (Moderate Drought)
-1.9 to +1.9 (Near Normal)
+2.0 or +2.9 (Unusual Moist Spell)
+3.0 or +3.9 (Very Moist Spell)
+4.0 or above (Extremely Moist)

Figure T – Palmer Drought Index (Source NCEI/NOAA)



Another measurement by the U.S. Drought Monitor, The U.S. Drought Monitor Drought Intensity Scale, classifies drought by 5 categories, D0 through D4 with D4 being the most extreme drought conditions. The maximum drought extent experienced for Brazoria County is a Category D4 drought as reported by the U.S. Drought Monitor in 2011 (Figure U). Therefore, it is surmised that Alvin also experienced a maximum D4 Drought.

Figure U - State of Texas Palmer Drought Severity Index, current September 27, 2011 (Source: NCEI/NOAA)



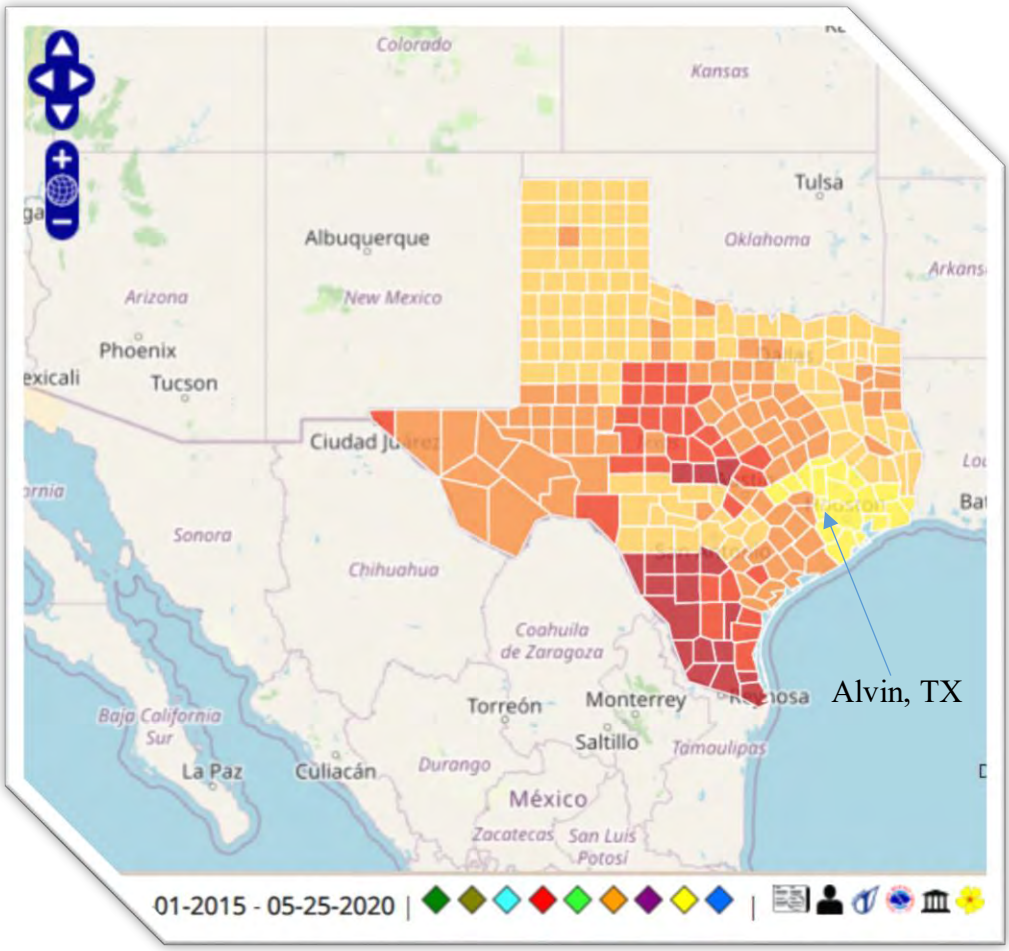
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	99.16	96.65	85.75
Last Week (09/20/2011 map)	0.00	100.00	100.00	99.03	96.10	85.43
3 Months Ago (06/28/2011 map)	2.68	97.32	95.71	94.52	90.62	72.32
Start of Calendar Year (12/28/2010 map)	7.89	92.11	69.43	37.46	9.59	0.00
Start of Water Year (09/28/2010 map)	75.57	24.43	2.43	0.99	0.00	0.00
One Year Ago (09/21/2010 map)	77.29	22.71	3.34	0.97	0.00	0.00

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 Alvin. Figure V 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 Alvin are not available.

Figure V - Drought Impact Report for Brazoria County, Texas



County Impacts	17
Category	
Agriculture	14
Fire	3
Plants & Wildlife	9
Relief, Response & Restrictions	5
Report Source	
Media	16
OtherAgency	1

Vulnerability

Drought risks to people and property within the City of Alvin cannot be distinguished by area; the hazard is reasonably predicted to have uniform probability of occurrence across the entire City. All people and assets are considered to have the same degree of exposure.

The drought hazard affects all residential and commercial building types about equally within the planning area. Vulnerable assets may include residential, commercial and critical facility buildings, crops, farms, and common assets such as drinking water. Lakes and rivers, soil and similar natural resources are also vulnerable.

Extreme Heat

Update from Last Plan

- Events since 2015, were updated and described.
- Due to NCEI data limits, 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.

Hazard Description - Extreme Heat

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

Extreme heat occurs on a regional scale; therefore, all of Alvin is equally at risk as it can occur anywhere in the City. The climate is humid subtropical, with hot summers and frequent, prolonged heat waves. Numerous heat-related fatalities have occurred in the areas surrounding Alvin. Many of these fatalities are likely to have occurred in more rural areas of Brazoria County (and thus outside the City of Alvin) where there are a greater number of homes without air conditioning.

Previous Occurrence

Data included in the current plan, derived from the NCEI database, indicates that between 1950 and 2008, there were six extreme heat events that affected the entire County, to include the City of Alvin. The NCEI database no longer shows extreme heat events when queried, so only prior events are summarized below in Table 3-9. The NCEI database indicated that for the six extreme heat events there were a total of 38 deaths, 200 injuries and no property damage in Brazoria County. As part of the original plan development a member of the public highlighted that there was a prolonged heat wave in July of 1980 that affected the City. This event was not listed in the NCEI database of extreme events.

When the NCEI database was queried from 2015-2020, there were no additional extreme heat events, so the NOAA Online Weather Data (NOWData) and the National Weather Service (NWS) Heat Index were queried from 2009-2020.

Table 3-9 - Extreme Heat Events in Brazoria County, 1950 – 2008 (Source: NOAA/NCEI)

6 TEMPERATURE EXTREMES event(s) were reported in **Brazoria County, Texas** between **01/01/1950** and **12/31/2008**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Texas

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 TXZ176>179 - 226>227 - 195>200 - 235>238 - 210>214	07/21/1995	2050	Heat Wave	N/A	2	200	0	0
2 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	06/26/1999	06:00 AM	Excessive Heat	N/A	3	0	0	0
3 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	08/01/1999	06:00 AM	Excessive Heat	N/A	6	0	0	0
4 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	07/06/2000	06:00 AM	Excessive Heat	N/A	19	0	0	0
5 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	08/29/2000	06:00 AM	Excessive Heat	N/A	3	0	0	0
6 TXZ163>164 - 176>179 - 195>200 - 210>214 - 226>227 - 235>238	09/01/2000	12:00 AM	Excessive Heat	N/A	5	0	0	0
				TOTALS:	38	200	0	0

According to the National Weather Service, the Houston Area, the closest local weather data collection center with comprehensive data, the mean number of days with a daily maximum temperature equal or greater than 90°F is 117. In 2011, Alvin experienced several days with extreme heat, with a peak temperature of 109°. Table 3-10 and 3-11 presents data from 2009-2020 for the monthly number of days with Temperatures greater than 90°F and the Monthly Highest Temperatures.

Table 3-10 - Monthly Number of Days Max Temperature =>90°, Houston Area (NOAA, NWS 2020)

Monthly Number of Days Max Temperature >= 90 for Houston Area, TX (ThreadEx)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2009	0	0	0	1	13	28	30	30	11	6	0	0	119
2010	0	0	0	0	17	26	23	31	18	8	0	0	123
2011	0	0	0	5	17	29	30	31	27	3	0	0	142
2012	0	0	0	0	16	25	22	30	15	1	0	0	109
2013	0	0	1	0	9	28	25	28	21	2	0	0	114
2014	0	0	0	1	0	22	26	27	15	6	0	0	97
2015	0	0	0	0	2	24	30	28	21	10	0	0	115
2016	0	0	0	0	0	21	30	21	25	9	0	0	106
2017	0	0	0	2	7	18	30	22	20	9	0	0	108
2018	0	0	0	0	20	25	27	30	11	7	0	0	120
2019	0	0	0	2	10	23	30	31	25	10	0	0	131
2020	0	0	2	3	11	M	M	M	M	M	M	M	M
Mean	0	0	0	1	10	25	28	28	19	7	0	0	117
Max	0 2020	0 2020	2 2020	5 2011	20 2018	29 2011	30 2019	31 2019	27 2011	10 2019	0 2019	0 2019	142 2011
Min	0 2020	0 2020	0 2019	0 2018	0 2016	18 2017	22 2012	21 2016	11 2018	1 2012	0 2019	0 2019	97 2014

Table 3-11 - Monthly Highest Maximum Temperature, Houston-Sugarland Memorial Station (NOAA, NWS 2020)

Monthly Highest Max Temperature for Houston Area, TX (ThreadEx).

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2009	83	85	84	90	94	104	102	101	94	93	81	77	104
2010	78	72	81	87	97	99	97	102	96	94	89	82	102
2011	75	83	86	93	98	105	102	109	102	91	84	77	109
2012	81	84	86	88	95	105	97	99	98	90	87	84	105
2013	81	79	90	85	93	107	99	101	100	93	85	81	107
2014	77	80	85	92	88	94	99	99	97	93	82	80	99
2015	81	83	83	88	91	94	101	106	96	95	84	83	106
2016	79	81	87	86	89	97	100	101	97	93	88	84	101
2017	81	87	87	91	93	96	100	99	93	94	89	81	100
2018	75	83	85	86	96	98	101	100	96	91	89	80	101
2019	79	82	87	91	93	97	97	103	100	93	83	84	103
2020	81	81	90	92	95	92	M	M	M	M	M	M	95
Mean	79	82	86	89	94	99	100	102	97	93	86	81	103
Max	83 2009	87 2017	90 2020	93 2011	98 2011	107 2013	102 2011	109 2011	102 2011	95 2015	89 2018	84 2019	109 2011
Min	75 2018	72 2010	81 2010	85 2013	88 2014	92 2020	97 2019	99 2017	93 2017	90 2012	81 2009	77 2011	95 2020

Future Occurrence
The probability of future events can be determined by assessing historical averages. Since extreme heat occurs on a regional scale, it is assumed that Alvin experienced the same or very similar conditions to the Houston Area. Based on the NOWData, Alvin can expect approximately 117 days of 90° or greater temperatures. As extreme heat events have occurred every year since 2000, the probability of extreme heat affecting the community is 100% in any given year.

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

Figure W – 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 NWS also posts the impact of prolonged exposure to Extreme Heat (Figure X):

Figure X

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution | Extreme Caution | Danger | Extreme Danger

Classification	Heat Index	Effect on the body
Caution	80°F - 90°F	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution	90°F - 103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger	103°F - 124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Danger	125°F or higher	Heat stroke highly likely

Within the City of Alvin, Extreme Heat risks to people and property cannot be distinguished by area; the hazard is reasonably predicted to have uniform probability of occurrence across the entire City. All people and assets are considered to have the same degree of exposure. Older and lower-income populations are generally presumed to be more vulnerable to the effects of very high temperatures, because they are either physical less capable of tolerating heat, or do not have air conditioning, or both. Excessive heat also places increased demands on the electrical power system and excessive usage could cause power outages. Power outages obviously impact those areas that lose power and can potentially impact vulnerable populations like the elderly, the young and the economically disadvantaged. Based on U.S. Census Quick Facts (In order for all of the category data to be compared in the same year, Table 3-12 used Alvin's 2019 population), the City of Alvin's vulnerable population is comprised of approximately 11,465 people.

Table 3-12 - Alvin Population Breakdown

Total Population 2019	100%	26,723
Persons under 5	8.4%	2,245
Persons 65 and older	12.4%	3,314
Persons With a Disability	5.9%	1,577
Persons in Poverty	16.2%	4,329
Total	42.9%	**11,465**

Vulnerability

To estimate potential dollar value of losses to existing buildings, the City of Alvin evaluated the prior loss data from the NCEI database. Alvin considers the extreme heat hazard as highly likely to impact the City on an annual basis. The most probable upper range of temperatures is around 110 degrees Fahrenheit. The extreme heat hazard affects all residential and commercial building types about equally within the planning area, although it is the population rather than the built environment that is most likely to suffer the effects of extreme heat. None of the events identified in the NCEI database caused any prior property damage. Due to the fact that there is no record of any historical building damage as a result of extreme heat, the estimated annual dollar value damage to existing or future buildings due to extreme heat is negligible. Everbridge is also used for mass communications and allows public alerting via geo-addressing with listed telephone numbers and can also alert specific communities, blocks or the entire City. This helps the City notify residents if there will be extreme heat days and what precautions should be taken.

The potential annual losses as a result of fatalities and personal injuries is calculated by using the values in the current FEMA BCA guidance which are $5.8 million for each fatality and $90,000 for treat and release injuries. Thus the annual estimated cost associated with loss of life from extreme heat in Brazoria County is approximately $3.673 million, and $300,000 for personal injuries. Similar to other hazards, using county and city census data the annual loss estimate for the entire County can be proportioned for the City of Alvin. Using 2019 U.S. Census population estimates, the 26,723 residents in Alvin represent approximately 7.1 percent of the County total population (374,264). Applying this percentage, it is estimated that the annual loss from extreme heat in the City of Alvin is approximately $283,678.

It is unclear why the NCEI data shown does not pre-date 1995 – the lack of information about earlier events distorts the calculation because the entire period of record (to 1950) is used to determine the annual losses. The figures should be considered conservative estimates, at best.

FLOOD

Update from Last Plan

- Events since 2015, 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

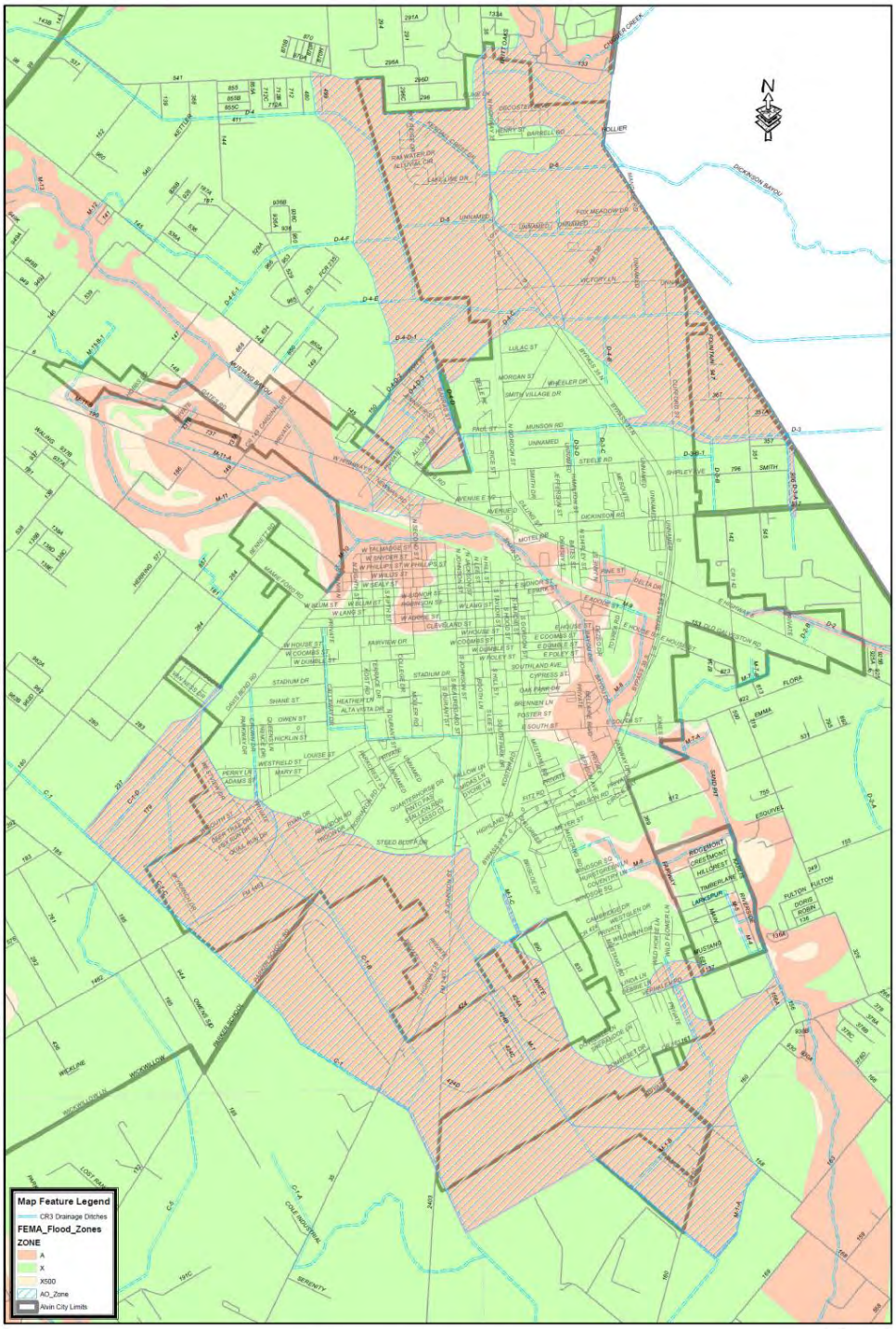
When rainfall runoff collects in rivers, creeks, and streams and exceeds the capacity of channels, floodwaters overflow onto adjacent lands. Floods result from rain events, whether short and intense or prolonged and less intense. In recent years, most flooding in Alvin has been associated with storms 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 Alvin have flooded throughout the City's history. Most recently, since 1990, Alvin has been impacted by six significant flood events including: 1994, 1998, 2001, 2005, 2008 and 2017.

Location - Flood

The location of the 1% (100-year) and 0.2% (500-year) annual chance event floodplains for the City of Alvin are shown in Figure Y. These are the locations within the planning area that are at greatest risk of flooding. There are 2,217 NFIP policies in force throughout the City.

Figure Y – City of Alvin FEMA Flood Zone Overlay



City of Alvin, Texas
FEMA Flood Zone Overlay

Previous Occurrences

The NCEI Storm Events Database only lists flood events from 1997 to present. The listed flood events show location and or a description of damages within Alvin. The NCEI indicates that between 1997 and 2020 there were 10 flood events that impacted the City of Alvin. There are no events listed prior to 1997, but it is assumed that flooding followed similar patterns in the past. For these events, the NCEI database reported no deaths or injuries and a total of $739,787,000 in damages. It is important to note, however, that there were a number of flood-related fatalities in the surrounding communities so there is a potential risk of loss of life, which as calculated by FEMA BCA guidance amounts to approximately $5.8 million each. Table 3-13 summarizes the 10 events that have occurred in the City of Alvin, including one that occurred since the last version of this Plan.

Table 3-13 Flood Events in the City of Alvin 1997 – 2020 (Source: NOAA/NCEI)

Location	Date	Dth	Inj	Damage	Event Description
Countywide*	1/27/1997	0	0	$5,000	Street Flooding
Countywide*	4/25/1997	0	0	$10,000	Street Flooding
Countywide*	6/5/2001	0	0	$22.2Million***	Tropical Storm Allison -Tropical Storm Allison hit the southeastern coast of Texas in early June and dumped up to 38 inches of rain over a five-day period resulting in 23 deaths and $5 billion in damages. The prolonged rainfall event caused massive flooding in and around the City of Houston. Allison also produced flooding throughout southeast Texas, Louisiana, and across the eastern United States. Total damages in Harris County alone (includes the Houston Metro area) were estimated near $5 billion and prompted a Presidential Disaster Declaration for 30 counties in Texas, including Brazoria County.
North portion of County*	8/31/2001	0	0	$500,000	Water reported in some homes
Countywide*	9/10/2002	0	0	$30,000	Countywide flooding
Countywide*	11/5/2002	0	0	$35,000	Street Flooding
Northeast portion of County*	12/4/2002	0	0	$2,000	Flooding in extreme northeast portion of County
North portion of County*	11/17/2003	0	0	$5,000	Flooding across northern Brazoria County
Countywide*	9/12/2008	0	0	$700 Million**	During hurricane Ike, the northern and southern part of the city of

Location	Date	Dth	Inj	Damage	Event Description
					Alvin were affected by shallow flooding caused by ponding of runoff during heavy rains.
Alvin	8/26/2017	0	0	$17 Million	During Hurricane Harvey, the City of Alvin sustained damages to four (4) City buildings, City owned vehicles, City equipment, and Park facilities. There were 263 properties that filed flood insurance claims and payouts totaled nearly $16 Million. There were at least an additional 62 homes which flooded, but either did not have flood insurance or did not file claims.
		0	0		

**Damage estimates for "Countywide, North Portion and Northeast portion" are not specific to Alvin, but the entire area affected from those floods.*
***A portion of the estimated damages for Tropical Storm Frances, Tropical Storm Allison and Hurricane Ike are due to wind, but the exact amount is unknown. These are also countywide damages.*

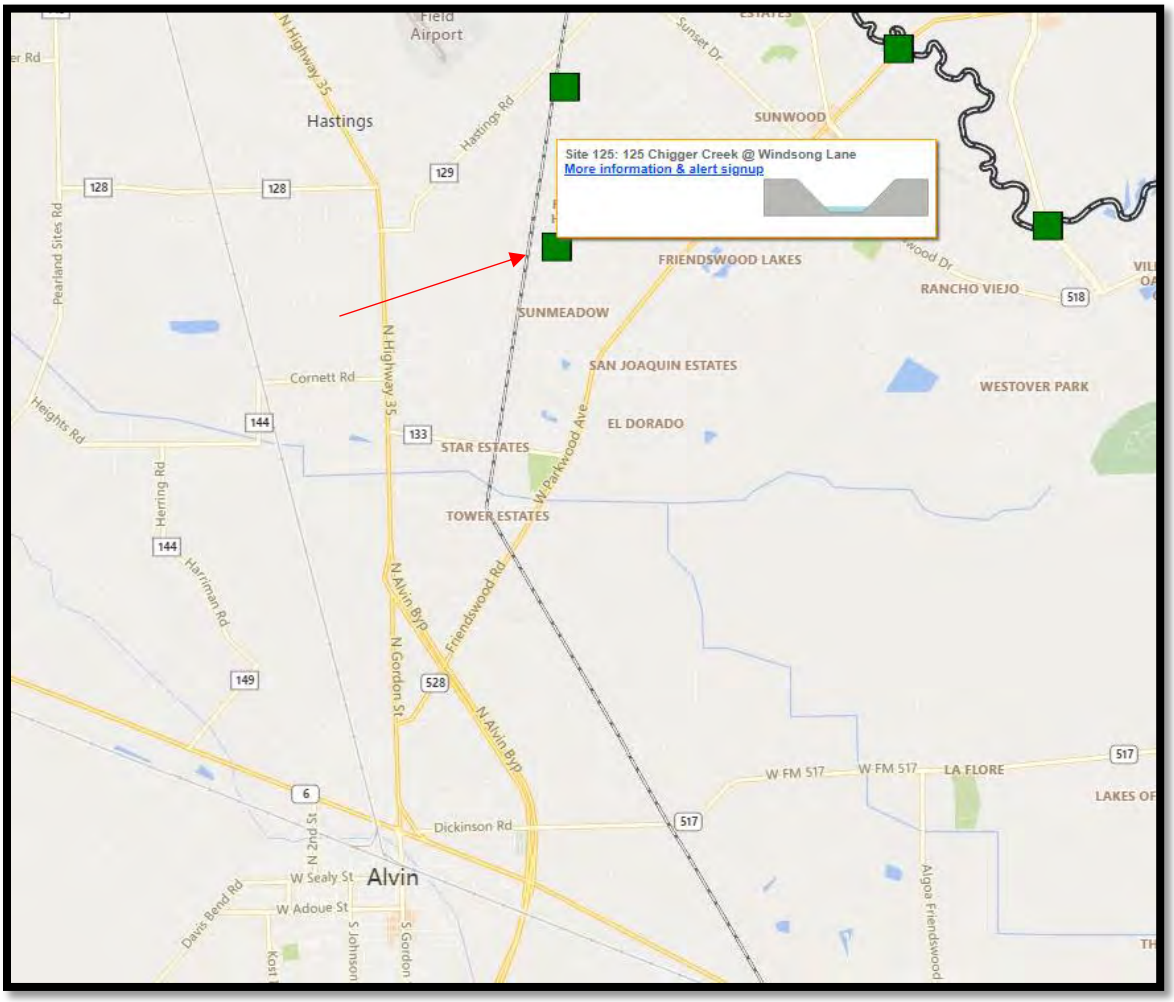
Future Occurrence
The City of Alvin has experienced 10 flood events between 1997 and 2020. 10 events reported over 23 years suggests a flood occurs approximately every other year on average, though frequently, it is limited to street flooding and costs confined to debris removal.

Flood Extent
Flood severity is measured in various ways, including frequency, depth, velocity, duration, and contamination, among others. In Alvin, characterizing the severity of the flood hazard depends on what part of the City 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 the City of Alvin.

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 City 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 City, there are 2,217 active flood insurance policies, many of which sit within the floodplain. Flooding can occur during any month of the year in Alvin; 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.

Alvin has been actively pursuing projects to reduce the severity of flooding in the area. The Figure below (Z) shows one rain gauge north of the City maintained by HCFCD. The City maintains and monitors another rain gauge at their wastewater treatment facility and intends to install more rain gauges in the future.

Figure Z - Rain Gauges near Alvin
Source: Harris County Flood Control District – Flood Warning System



This gauge shows real time data including water level showing how far water is below the bank and expected water elevation for a 10-year, 50-year, 100-year and 500-year event. It also shows high water marks during various storms. The tables below (3-14 and 3-15) are for the 125 Chigger Creek at Windsong Lane (the gauge indicated by the red arrow). The top of the bank for this part of Chigger Creek is 28.00 Feet. Table 3-16 provides the amount of rain by month by year that Alvin has experienced in the last five years.

Table 3-14 - Flood Water Elevation and Frequency for 125 Chigger Creek @ Windsong Lane
Source: Harris County Flood Control District – Flood Warning System

Flood Frequency	Elevation
10% (10-year)	29.62’
2% (50-year)	30.56’
1% (100-year)	30.99’
.2% (500-year)	32.03’

Table 3-15- Historical Storm Water Elevation for the Chigger Creek Gauge at Windsong Lane
Harris County Flood Control District – Flood Warning System

Date	Event	Elevation* (Top of Bank 28.00’)
9/13/2008	Ike	25.90’
4/18/2009		30.30’
8/27/2017	Harvey	31.80’

As noted by Table 3-15, Hurricane Harvey pushed flood waters nearly four feet over the top of the bank in this area. Many nearby gauges show similar data, with a few gauges showing some of the above storms other than Harvey also exceeding the banks of the creeks.

Table 3-16 Monthly Rain Recorded at the City of Alvin Wastewater Treatment Plant

2015	inches		2016	inches		2017	inches
JANUARY	9.90		JANUARY	7.09		JANUARY	5.91
FEBRUARY	1.40		FEBRUARY	2.48		FEBRUARY	2.41
MARCH	8.50		MARCH	4.94		MARCH	3.78
APRIL	8.60		APRIL	4.72		APRIL	6.60
MAY	9.50		MAY	9.05		MAY	4.11
JUNE	10.00		JUNE	6.92		JUNE	6.93
JULY	0.50		JULY	1.01		JULY	3.22
AUGUST	6.31		AUGUST	8.8		AUGUST	30.61
SEPTEMBER	7.36		SEPTEMBER	1.63		SEPTEMBER	1.63
OCTOBER	10.85		OCTOBER	0.13		OCTOBER	4.43
NOVEMBER	4.41		NOVEMBER	4.76		NOVEMBER	0.11
DECEMBER	2.99		DECEMBER	7.00		DECEMBER	5.01
2015 Total	**80.32**		**2016 Total**	**58.53**		**2017 Total**	**74.75**
2018	**inches**		**2019**	**inches**		**2020**	**inches**
JANUARY	10.78		JANUARY	5.88		JANUARY	6.82
FEBRUARY	6.06		FEBRUARY	2.93		FEBRUARY	1.149

MARCH	2.92		MARCH	0.52		MARCH	1.03
APRIL	1.97		APRIL	1.98		APRIL	2.28
MAY	2.3		MAY	10.44		MAY	
JUNE	3.89		JUNE	9.93		JUNE	
JULY	7.55		JULY	4.2		JULY	
AUGUST	3.51		AUGUST	5.03		AUGUST	
SEPTEMBER	17.95		SEPTEMBER	12.13		SEPTEMBER	
OCTOBER	9.13		OCTOBER	8.5		OCTOBER	
NOVEMBER	3.62		NOVEMBER	3.16		NOVEMBER	
DECEMBER	6.33		DECEMBER	2.26		DECEMBER	
2018 Total	**76.01**		**2019 Total**	**66.96**		**2020 Total***	**11.279**

Impact

Table 3-17 describes the inventory counts for buildings in the City of Alvin.

Table 27 Structures within the City of Alvin

Type	Number of Structures
Single Family Homes	6665
Multi-family Homes	218
Total Residential	6883
Commercial Buildings	895
Municipal	76
School District	40 (19 within City of Alvin)

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 September 2019, 2,217 federal flood insurance policies were in-force. These insurance policies are administered by the National Flood Insurance Program (NFIP). There are 132 Repetitive Loss structures, 26 of those are Severe Repetitive Loss structures in Alvin. Of those 132 properties, 52 are insured and thus, 60 percent are not insured. 18 of the 26 Severe Repetitive Loss structures are currently insured and thus, approximately 31 percent are not insured.

NFIP Repetitive Loss Properties

In recent years, FEMA has focused considerable attention on the Repetitive Loss (RL) subset of insured buildings. These properties have received two or more claim payments of at least $1,000 over a ten-year period. FEMA's database identifies 106 properties as RL properties in Alvin (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 $5.7 million (includes payments for building damage and contents damage).

As of September 2019, repetitive loss statistics for areas within Alvin showed 106 Repetitive Loss properties. Of this total, 101 were categorized as residential properties and five were non-residential. Table 3-18 summarizes the RL Statistics for the City of Alvin (SRL properties are broken out and analyzed separately).

Table 3-18 - RL Statistics for the City of Alvin (Source: FEMA, 2019)

Properties	Building Payments	Contents Payments	Total	# of claims	Average
106	$4,758,711	$968,938	$5,727,649	259	$22,114

Flood Risk to Residential Repetitive Loss Properties

Table 3-19 provides a summary of residential repetitive flood insurance claims for individual streets with two homes or more on the RL List in Alvin. 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 101 residential repetitive loss properties received claim payments over $5.6 million (includes payments for building damage and contents damage).

Table 3-19 - Summary of Residential NFIP Repetitive Loss Statistics; Alvin, TX

Street Name	RL Properties	Number of Claims	Total Paid	Average Claim Payment
*********	6	18	$412,135	$22,896
*********	5	11	$203,619	$18,511
*********	4	11	$322,570	$29,325
*********	4	10	$204,666	20,467
*********	4	9	$65,390	$7,266
*********	3	8	$60,116	$7,515
*********	3	7	$111,568	$15,938
*********	3	6	$237,948	$39,658
*********	3	6	$268,353	$44,725
*********	3	6	$60,950	$15,238
*********	2	4	$66,422	$16,605

Street Name	RL Properties	Number of Claims	Total Paid	Average Claim Payment
*********	2	4	$54,134	$13,534
*********	2	4	$72,805	$18,201
*********	2	4	$53,949	$13,487
*********	2	4	$84,829	$12,118
*********	2	7	$394,098	$98,524
*********	2	4	$23,012	$4,602
*********	2	5	$97,426	$19,485
*********	2	5	$44,451	$11,113
*********	2	4	$35,637	$8,909
*********	2	4	$84,166	$21,041
Remaining 42 streets each with only one RL property.	42	109	$2,688,728	$24,667
Grand Total	**101**	**248**	**$5,646,977**	**$22,770**

Alvin 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 2019, a period of 40 years. Table 3-20 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."

When we take the historical losses of $10,012,388.62 experienced over a 40-year period, we derived annualized losses of $250,309.72. We then determine the net present value of annualized losses of $250,309.72 over a hundred-year horizon. To do this we use the 100-year net value coefficient of 14.27. The calculated net present value of a $250,309.72 annual loss over the next 100 years is $3,571,919.70.

The difference between $10,012,388.62 experienced over a 40-year period and a projected $3,571,919.70 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 $3,571,919.70. While it is an estimate, it offers a useful metric that can be used in assessing the potential cost effectiveness of mitigation actions.

Table 3-20– Projected 100-year Flood Risk in Alvin to Severe Repetitive Loss and Repetitive Loss Properties (Source: FEMA NFIP query September 2019)

Data	Value
Period in years	40
Number of claims	387
Average claims per year	9.675
Total value of claims	$10,012,388.62
Average value of claims per year	$250,309.72
Projected risk, 100-year horizon	**$3,571,919.70**

Table 3-21 shows the above risk to just residential Repetitive Loss Properties. There have been 248 claims in the 40-year period, for an average number of 6.2 claims per year.

Table 3-21 – Projected 100-year Flood Risk in Alvin to Residential Repetitive Loss Areas (Source: FEMA NFIP query September 2019)

Data	Value
Period in years	40
Number of claims	248
Average claims per year	6.2
Total value of claims	**$5,646,977.31**
Average value of claims per year	$141,174.43
Projected risk, 100-year horizon	**$2,014,559.16**

Non-Residential Repetitive Loss Properties

As noted earlier, as of September 2019, Alvin had five non-residential repetitive loss properties in the NFIP database. Table 3-22 provides a summary of non-residential repetitive loss claims for five individual streets in Alvin with non-residential RL properties. Similar to the residential repetitive loss data, address data about individual sites is omitted for reasons of privacy.

Table 3-22 – Projected 100-year Flood Risk, Non-Residential Repetitive Loss Properties in Alvin (Source: FEMA NFIP query September 2019)

Street Name	Claims	Properties	Total Claims ($)	Average Claim Payment
********	3	1	$14,523	$4,841
********	2	1	$38,099	$19,049
********	2	1	$4,272	$2,136
********	2	1	$16,816	$8,408
********	2	1	$6,964	3,482
Total	**11**	**5**	**$80,672**	**$7,334**

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 be 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 3-23.

Table 3-23 – Projected 100-year Flood Risk in Alvin to Non-Residential Repetitive Loss Areas (Source: FEMA NFIP query September 2019)

Data	Value
Period in years	40
Number of claims	11
Average claims per year	0.275
Total value of claims	$80,672
Average value of claims per year	$7,334
Projected risk, 100-year horizon	**$104,656**

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 as a residential property that is covered under an NFIP flood insurance policy and:

- has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
- for which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

SRL properties are a subset of the RL list but were not included in the analyses above. As of September 2019, Alvin had 26 properties on the SRL list, 25 of which are residential and 18 are insured. Table 3-24 provides loss estimates for SRL properties in Alvin summarized at the street level, as calculated by FEMA and the NFIP.

Table 3-24– Projected 100-year Flood Risk, Severe Repetitive Loss Properties in Alvin (Source: FEMA/NFIP, Query September 2019)

Street Name	Properties	Claims	Total Claims ($)	Average Claim Payment
**********	7	35	$1,041,535	$29,758
**********	2	11	$ 192,196	$17,472
**********	2	7	$ 1,088,817	$155,545
**********	2	13	$ 335,144	$25,780
**********	2	7	$ 116,115	$16,588
Remaining 11 streets each with only one SRL property.	11	55	$1,510,931	$27,471
	26	**128**	**$ 4,284,738**	**$ 33,475**

It should be noted that some of the properties on this list may be at far greater flood risk than indicated, because there may be 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 3-25– Projected 100-year Flood Risk in Alvin to Severe Repetitive Loss Areas (Source: FEMA NFIP query September 2019)

Data	Value
Period in years	40
Number of claims	128
Average claims per year	3.2
Total value of claims	$ 4,284,738
Average value of claims per year	$107,118.45
Projected risk, 100-year horizon	**$1,528,580.28**

Flood Risks – Public Buildings

Figure AA shows the overlap of critical facilities in the floodplain.

Figure AA – City of Alvin Critical Facilities in Relation to the Floodplain

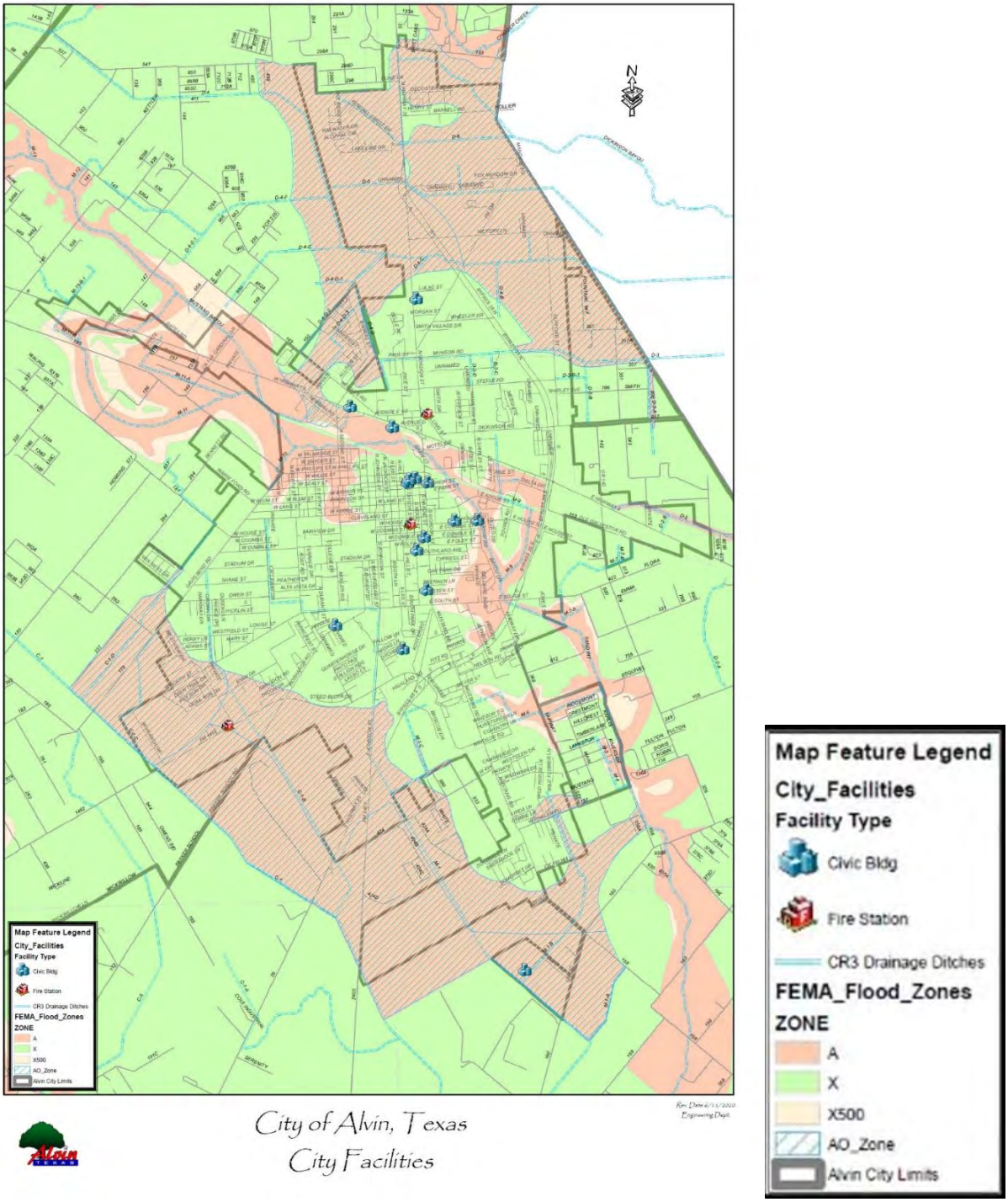
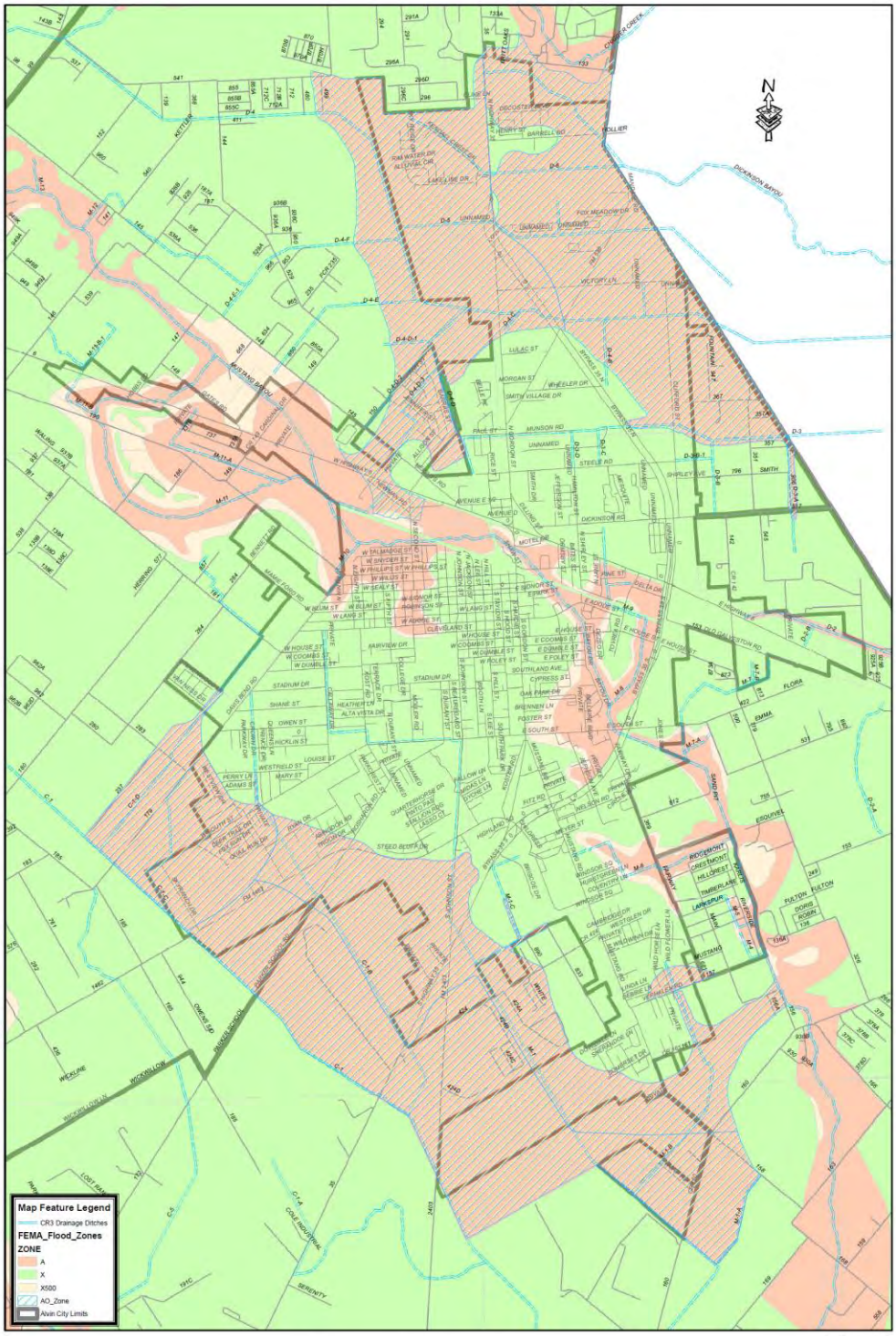


Table 3-26 – City of Alvin Buildings and Facilities

Facility Name	Address	Use	CF*	Flood Zone
Fire Station #3/ 100KW Gen	2700 FM 1462	Fire Protection	NO	AO
Playground Equipment	1200 Newman St.	Parks	NO	AO
500KGal. Elevated Storage Tank	5425 Mustang Road	Utilities/Water	NO	AO
Bathhouse/Restroom/Office	919 Bayou Dr.	Parks	Yes	AE
Pump House at Pool	919 Bayou Dr.	Parks	NO	AE
Bob Owens Pool	919 Bayou Dr.	Parks	NO	AE
Animal Control	550 W Hwy 6	Animal Control	Yes	Not In SHFA
Railroad Depot Museum	119 E Willis St.	Historical/Museum	Yes	Not In SHFA
Vehicle Shop	1100 W Hwy 6	Fleet Maintenance	Yes	Not In SHFA
Senior Center	309 W Sealy St.	Public Services	Yes	Not In SHFA
Public Library	105 South Gordon St.	Library	Yes	Not In SHFA
Waste Water Treatment Plant /office /lab/Equipment	7100 CR 160	Utilities/Sewer	Yes	Not In SHFA
EMS Bldg. - Office & Garage	709 E House St.	Emergency Medical	Yes	Not In SHFA
Fire Station W /8KW Generator	302 W House St.	Fire Protection	Yes	Not In SHFA
City Hall Bldg.	216 W Sealy St.	Administration	Yes	Not In SHFA
Alvin Police Station	1500 S Gordon St.	Police	Yes	Not In SHFA
Alvin Museum	304 W. Sealy St.	Historical/Museum	NO	Not In SHFA
500KGal. Elevated Storage Tank	800 Dyche Lane	Utilities/Water	NO	Not In SHFA
Lions Park Restroom Bldg.	1060 College Dr.	Athletics	NO	Not In SHFA
Fire Station w/25KW Generator	310 Medic Lane	Fire Protection	NO	Not In SHFA
Dugout Shelter #1	2200 Westpark Dr.	Parks	NO	Not In SHFA
Score Booth #3	2200 Westpark Dr.	Parks	NO	Not In SHFA
Picnic Shelter #2	2200 West Park Dr.	Parks	NO	Not In SHFA
Playground Equipment	900 W Sealy St.	Parks	NO	Not In SHFA
Playground Equipment	Talmadge & 6th St.	Parks	NO	Not In SHFA
Pearson Field/Field Box Storage Bldg.	2201 Westpark Dr.	Parks	NO	Not In SHFA
Playground Equipment	2200 Westpark Dr.	Parks	NO	Not In SHFA
Playground Equipment	800 Shaw St.	Parks	NO	Not In SHFA
Morgan Park Concession Bldg.	1600 W South St.	Parks	NO	Not In SHFA
Pearson Field Concession Bldg.	2201 Westpark Dr.	Parks	NO	Not In SHFA
Pearson Field Restroom	2200 Westpark Dr.	Parks	NO	Not In SHFA
Lions Park Field Lightning	1060 College Dr.	Parks	NO	Not In SHFA
Morgan Park Field Lighting	1600 W. South St.	Parks	NO	Not In SHFA
Equipment Shed/Storage	1100 W Hwy 6	Public Services	NO	Not In SHFA

*CF stands for critical facility

Figure AB - City of Alvin Effective FIRM



City of Alvin, Texas
FEMA Flood Zone Overlay

Public Schools. The Alvin Independent School District (ISD) maintains the 40 facilities for seven municipalities. Of the 40, 19 public schools and buildings are located within the City of Alvin. Based on a review of the FIRM, of the 19 buildings, all but one are in Zone X. The only address that falls within the 100-year floodplain 5000 Mustang Road and sits in the 1-Foot AO Zone.

Flood Risks – City Assets

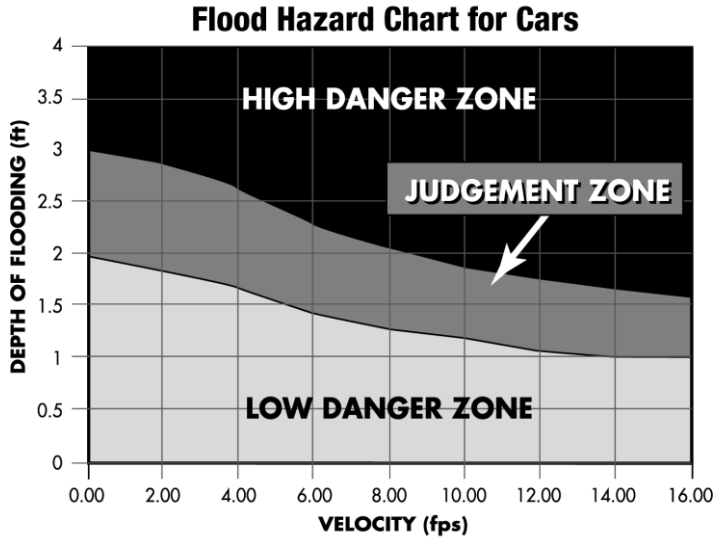
Aside from City facilities, the City also owns other assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles. Some of those vehicles are stored in the covered vehicle storage area, while others are not. In both cases, they are kept far from the floodplain. However, some of these vehicles are often in use and at various project sites that may sit in a flood prone area. The City 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. During Hurricane Harvey, some City vehicles and equipment were damaged.

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 (Texas Environmental Center, online). As illustrated in Figure AC, 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 AC

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



Within the City limits of Alvin there are 180 miles of city-maintained roads. Although most roads in Alvin are unlikely to have deep or fast-moving water during flood conditions up to the level of the 100-year flood, many can experience minor flooding conditions on a regular basis. Table 3-27, prepared by Alvin's Public Services Department, lists roads and intersections that where "High Water" signs and barricades are placed when those roads flood. As part of the 2020 Plan update, the MPC reviewed the flood prone roads included in Table 3-27.

Table 3-27 - Flood-Prone Roads in Alvin (Source: City of Alvin)

Flood-Prone Roads
S Hood St. from W South St to W Dumble St.
Westfield St. at Rowan Burton St.
Adams St. at Rowan Burton St.
Perry St. at Rowan Burton St.
Intersection at Gordon Stat House St.
W. South St. from S. Hood St. to S. Johnson St.
W. South St. at Callaway St.
Kings Lane at W. South St.
E. South St. at Jephson Ave.
W. South St. at S. Johnson St.
W. Stadium Dr. at S. Johnson St.
W. Stadium Dr. at S. College Dr.
S. Johnson St. at W. Adoue St.
W. Adoue St. at S. Second St.
S. Second St. at W. Sealy St.
W. Coombs at S. Hood St.
W. Adoue St. from 4th St. to S. Second St.
Smith Dr. at Steele Rd.
Koster Rd. at Glenview Dr.
Glenview Dr. at W. South St.
Deer Trail at Rowan Burton Rd.
Quail Run at Rowan Burton Rd.

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 similarly considers floodplain and floodway impacts in its planning and design for City roads. Developers must satisfy the City's drainage criteria and other aspects of road designs in order for the City 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.

Flood Risks – Local Drainage

Many areas and streets experience accumulations of rainfall that are slow to drain, 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. Localized street flooding throughout some subdivisions in Alvin is a persistent problem, common even during the frequent rainstorms experienced in the planning area. It is a concern because access for emergency services (fire, emergency medical) can be impeded. 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.

Vulnerability

Properties identified as Repetitive or Severe Repetitive Loss 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. Everbridge is also used for mass communications and allows public alerting via geo-addressing with listed telephone numbers and can also alert specific communities, blocks or the entire City. This can help alert residents in areas that are expected to experience a flood.

Hail

Update from Last Plan

- Included Hail as it was not in the last plan
- 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

Hailstorm events are a potentially damaging outgrowth of severe thunderstorms. During the development stages of a hailstorm, ice crystals form within a low pressure front due to the rapid rising of warm air into the upper atmosphere, and the subsequent cooling of the air mass. Frozen droplets gradually accumulate into ice crystals until they fall as precipitation that is round or irregularly shaped mases of ice typically greater than 0.75 inches in diameter. The size of hailstones is a direct result of the size and severity of the storm.

Location

The entire planning area is equally exposed to the hailstorm hazard. Hailstorms affect the County equally and uniformly, and every location in the County has been affected by hailstorms at some time in the past. The land area affected by individual hail events is approximately the same as that of a parent thunderstorm, an average of 15 miles in diameter around the center of a storm.

Previous Occurrence

NCEI provides hazard data by County. Querying the storm events database from 09/01/2000 through 12/31/2019, the database only reports events with hail 0.75 inches in diameter or above. The database reports that there were 36 hail events on different days reported in Brazoria County. Of those, there are no injuries or deaths reported. The property damage totals $475,000. Sorting the database specifically for Alvin, the table below shows the reported incidents and damages from the NCEI.

Table 3-28 – Historical Hail Event in Alvin 2000 – 2019 (Source: NOAA/NCEI)

County	Location	Event Date	Event Type	Magnitude (Diameter)	Deaths	Injuries	Property Damage
Brazoria	Alvin	5/2/2000	Hail	0.88”	0	0	$15,000
Brazoria	Alvin	5/30/2002	Hail	1.75”	0	0	$15,000
Brazoria	Alvin	6/5/2004	Hail	0.75”	0	0	$7,000
Brazoria	Alvin	10/12/2006	Hail	0.75”	0	0	$0
Brazoria	Alvin	4/4/2012	Hail	1.0-2.75*	0	0	$14,000
Brazoria	Alvin	2/26/2019	Hail	1.0”	0	0	$0
				1.16” Average	**0**	**0**	**$51,000**

*The 4/4/12 event was reported four different places within the City of Alvin with hail sizes ranges from 1.0-2.75 inches with an average of 1.81 inches in diameter.

Future Occurrence Using the historical hazard event data to determine the probability of an event occurring again within a given year, since 2000 Alvin has had six reported hail events, therefore there is a probability of 30% event occurring in any given year.

Extent

The severity of hailstorms is measured by duration, size of the hail itself, and geographic extent. All of these factors are directly related to the weather phenomena that create the hail, thunderstorms. There is wide potential variation in these severity components. Outside of the coastal regions, most of the United States experiences hailstorms at least two or more days each year.

Hailstorm intensity is measured by size of the hail and the potential damage is can cause. NCEI uses the Combined NOAA/TORRO Hailstorm Intensity Scales (see Table 3-29 below). Reviewing the historical information about previous intensity categories, the planning area could see an intensity category from H0 – H7.

Table 3-29 – Hailstorm Intensity

Size Code	Intensity Category	Typical Hail Diameter (in.)*	Approximate Size	Typical Damage Impacts
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble	Slight general damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Ping Pong Ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Egg	Aircraft bodywork dented, brick walls pitted
H7	Very Destructive	2.4-3.0	Tennis Ball	Severe roof damage, risk of serious injuries
H8	Very Destructive	3.0-3.5	Baseball	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball and Up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Impact
Based on historical records from the NCEI database the future probability of hail storms in the City could cause minor to severe injuries to persons (due to being hit by hail), dings and dents in automobiles, damage to housing siding, and damage to roof shingles on residential, commercial, and industrial structures.

Vulnerability
Damage from hail is estimated at approximately 1 billion dollars per year. Much of the damage by hail is to crops, however, no crop damage is reported in the planning area through NCEI. Vehicles, roofs of building and homes, and landscaping are most commonly damaged by hail in the planning area.

Utility systems on roofs at critical facilities would be vulnerable and could be damaged. Hail can cause threat to people as they could be struck by hail or failing trees and branches. Additionally, utility interruption can occur from downed power lines causing an interruption in service to residents and critical infrastructure. This can degrade critical services and impede or eliminate the ability of critical facilities to satisfy demand for service. Everbridge is also used for mass communications and allows public alerting via geo-addressing with listed telephone numbers and can also alert specific communities, blocks or the entire City. This will notify residents to stay indoor during an expected hailstorm.

Hurricane and Tropical Storm

Update from Last Plan

- Events since 2015, 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.

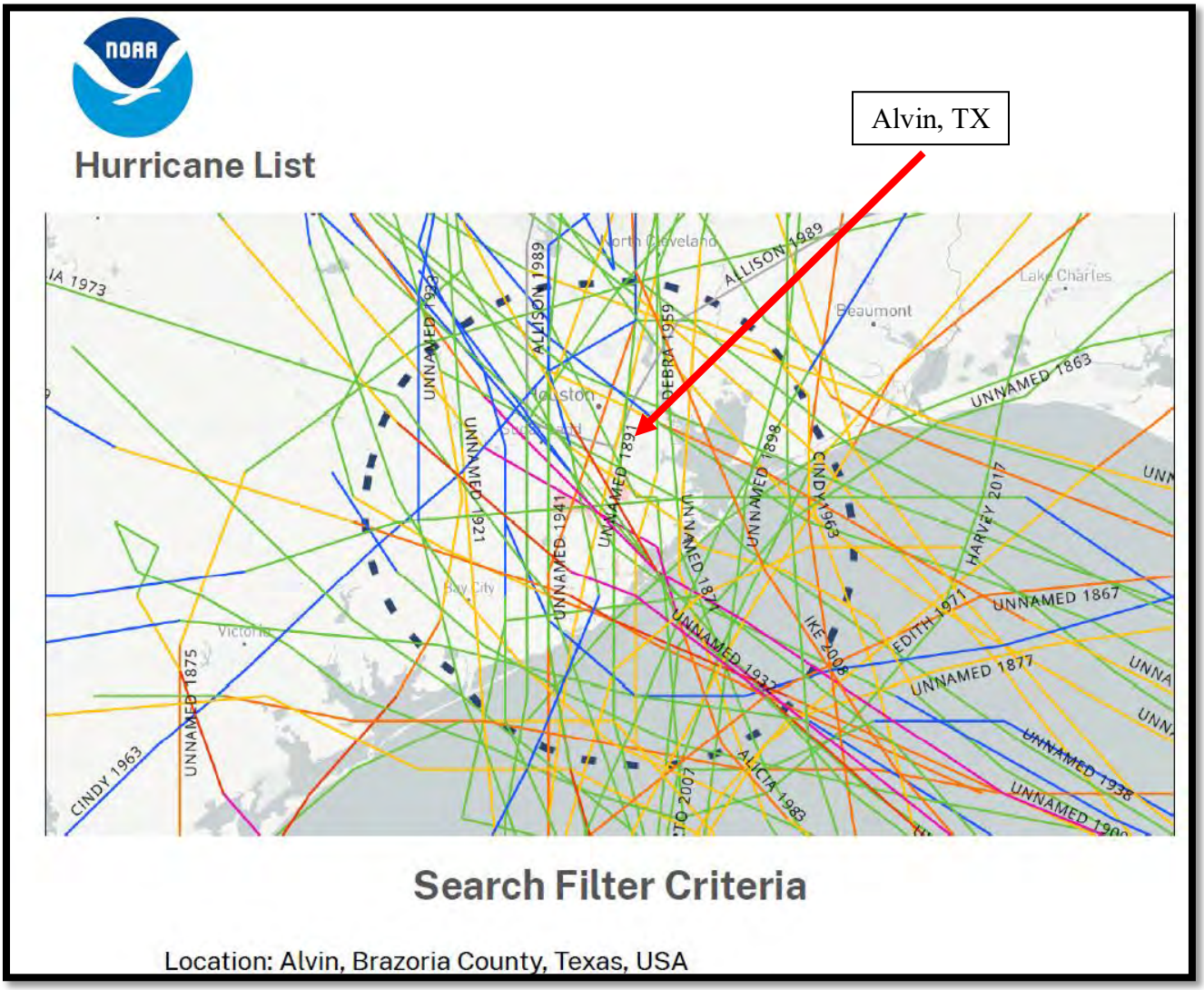
Hazard Description - Hurricane and Tropical Storm

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 Alvin, located within close proximity to the Gulf of Mexico, the City is exposed to risk from hurricanes. Due to the widespread effects of hurricane and tropical storms, the entire planning area is affected equally. Figure AD shows the location of Alvin, indicated by the red arrow, and the paths of the 61 hurricanes and tropical storms that came within 60 Miles of the City (dotted black line).

Figure AD - Historical Hurricane/Tropical Storm Tracks
(Source: NOAA Historical Hurricane Tracks)



Previous Occurrences

The NCEI Storm Events Database is limited to hurricane and tropical storm events from 1998 to 2020 so NOAA's Historical Hurricane Tracks was used. NOAA indicates that between 1842 and 2019 there were 35 hurricanes and 26 tropical storms within 60 miles of the City of Alvin. The 25 events since 1950 are shown in the table below.

Table 3-30 Hurricanes and Tropical Storms the City of Alvin 1950 - 2019
(Source: NOAA/NCEI)

Storm Name	Date	Storm Category (highest recorded point near planning area)
Bertha	08/08/1957 – 08/11/1957	Tropical Storm

Storm Name	Date	Storm Category (highest recorded point near planning area)
Debra	07/22/1959 – 07/27/1959	H1
Cindy	09/16/1963 – 06/20/1963	H1
Abby	08/05/1964 – 08/08/1964	Tropical Storm
Felice	09/12/1970 – 09/17/1970	Tropical Storm
Fern	09/03/1971 – 09/13/1971	H1
Edith	09/05/1971 – 09/18/1971	H5
Delia	09/01/1973 – 09/07/1973	Tropical Storm
Elena	08/30/1979 – 09/02/1979	Tropical Storm
Danielle	09/04/1980 – 09/07/1980	Tropical Storm
Alicia	08/15/1983 – 08/21/1983	H3
Bonnie	06/23/1986 – 06/28/1986	H1
Unnamed 1987	08/09/1987 – 08/17/1987	Tropical Storm
Allison	06/24/1989 – 07/01/1989	Tropical Storm
Chantal	07/30/1989 – 08/03/1989	H1
Jerry	10/12/1989 – 10/16/1989	H1
Dean	07/28/1995 – 08/02/1995	Tropical Storm
Allison	06/05/2001 – 06/19/2001	Tropical Storm
Claudette	07/07/2003 – 07/17/2003	H1
Grace	08/30/2003 – 09/02/2003	Tropical Storm
Humberto	09/12/2007 – 09/14/2007	H1
Edouard	08/03/2008 – 08/06/2008	Tropical Storm
Ike	09/01/2008 – 09/15/2008	H2
Harvey	08/25/2017 – 08/30/2017	H4
Imelda	09/16/2019 – 09/19/2019	Tropical Storm

Significant Historic Events

Unnamed Hurricane of 1900 (09/05/1900 - 09/15/1900, Category 4): The Hurricane of 1900 made landfall near Galveston on September 8, 1900 as a Category 4 hurricane with estimated winds of 145 mph. This was the deadliest and one of the costliest storms in U.S. history. Approximately 8,000 fatalities occurred. There is no record of fatalities in the Alvin.

Unnamed Hurricane of 1915 (08/17/1915 – 08/20/1915, Category 4): The Hurricane of 1915 made landfall near Galveston, following a similar path to the unnamed hurricane of 1900. In Houston, there were 80 mph winds and heavy rainfall and nearly $1 Million in damages. There is no record of fatalities, injuries or damages in Alvin.

Tropical Storm Claudette (July 1979): Tropical Storm Claudette holds the record for the most rainfall in Alvin in a 24 hour period (42 inches),

Hurricane Alicia (08/15/1983 - 08/21/1983, Category 3): Hurricane Alicia made landfall approximately 25 miles southwest of Galveston, Texas as a Category 3 hurricane with winds of

115 mph. Throughout the State, Hurricane Alicia caused 21 fatalities, produced 23 tornadoes (in the Houston Galveston area), and over $2 billion in damages. There is no specific record of damage in Alvin.

Tropical Storm Allison (06/06/2001 – 06/09/2001): Tropical Storm Allison made landfall to the West of Galveston Island. Over the next five days, Allison produced record rainfall that led to devastating flooding across Southeast Texas, including Brazoria County.

Hurricane Ike (09/12/2008 – 09/13/2008): Hurricane Ike made landfall as a Category 2 Hurricane with a storm surge of 7 to 10 feet in Brazoria County and caused an estimated $700 Million in damage within Brazoria County. The northern and southern part of the city of Alvin are affected by shallow flooding caused by ponding of runoff during heavy rains. Principal physical features that affect flooding in the southern runoff part of the city of Briscoe Canal, which blocks the passage of runoff southward, and its parallel ditch, C-1, which lacks the capacity to channel the runoff southeastward. In the northern part of the city, the movement of water eastward via Dickinson Bayou and its tributaries are slowed by the American Canal System.

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 Brazoria County, causing an estimated $2 Billion in damages. Several tornadoes touched down. Major to record flooding occurred along the Brazos and San Bernard Rivers and several other creeks and tributaries including Oyster Creek.
In Alvin, the City sustained damages to four (4) City buildings, City owned vehicles, City equipment, and Park facilities. There were 263 properties that filed flood insurance claims and payouts totaled nearly $16 Million. There were at least an additional 62 homes which flooded, but either did not have flood insurance or did not file claims.

Future Probability
Because the effects of hurricanes and tropical storms are regional in nature, the events that impacted Brazoria County are assumed to have impacted the City of Alvin as well. The City of Alvin has experienced 61 hurricane and tropical storm events between 1842 and 2019. With 61 events reported over 178 years, a hurricane or tropical storm occurs approximately every three years on average. Therefore, there is a 34% chance of a hurricane or tropical storm event affecting the planning area in any given year.

Extent
The Tables below (3-31 and 3-32) identify the criteria for each stage of development. The Saffir/ Simpson Hurricane Scale 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. The City of Alvin can expect to experience a storm ranging from a tropical depression to a category 5 hurricane in the planning area.

Table 3-31 - 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 3-32- 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 Alvin, hurricanes as severe as Category 4 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 City can expect to see tropical storms and hurricanes as severe as Category 5 causing extreme and even catastrophic damage in some cases.

Vulnerability

Severe hurricanes and tropical storms have flooded thousands of homes, closed and damaged many roads throughout the City and damaged City buildings and equipment. In order to mitigate the flood risk, the City requires 12 inches of freeboard above the standard Base Flood Elevation. Several different areas within the City remain cause for concern among 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 majority of floodplain in the City is located along the Mustang Bayou. There is also a large section of

floodplain that follows along the Chocolate and Austin Bayous in the western portions of the City. Another concern is that four City buildings were damaged during Hurricane Harvey and could be damaged again in another similar event. At 10.93 square miles, the 100-year floodplain makes up 49.5 percent of the total land area in the City of Alvin (total area is 22.05 square miles). When a hurricane is expected to impact the City, Everbridge will be used for mass communication.

Severe Thunderstorm High Wind

Update from Last Plan

- Events since 2015, 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.

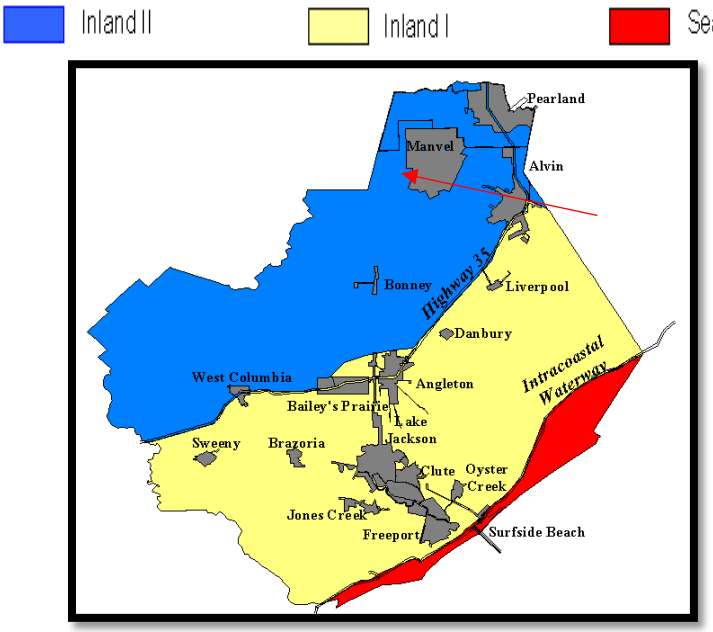
Location - Severe Thunderstorm High Wind

Figure AE shows the "3-Second Gust Design Wind Speed" map from the Texas Department of Insurance. This map is used to design buildings to withstand reasonably anticipated winds in order to minimize property damage. The City falls within the areas designated as "Inland II", where buildings need to be built to withstand 3-second gusts of 110 miles per hour. The building code administered by the City requires all new construction to be designed and constructed for 140 miles per hour wind loads. The high wind hazard could be experienced anywhere within the City and affects the entire planning area.

Figure AE- 3-Second Gust Design Wind Speed

(Source: http://www.tdi.texas.gov/wind/maps/brazoria.html#map)

INLAND II, 110 mph 3-second gust design wind speed



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 2019 there were 15 High Wind events that impacted the City of Alvin. For these events, the NCEI database reported no fatalities and one injury and a total of $296,500 in damages. Table 3-33 summarizes the 15 events that have occurred in the City of Alvin, including four that occurred since the last version of this Plan.

Table 3-33- Severe Thunderstorm High Wind Events within the City of Alvin 1993 - 2019 (Source: NOAA/NCEI)

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Location	Date	Deaths	Injuries	Property Damage
Countywide	5/2/1993	0	0	$ 10,000.00
Alvin	6/11/1995	0	0	$ 5,000.00
ALVIN	9/3/1996	0	0	$ 5,000.00
ALVIN	9/9/1997	0	0	$ 2,000.00
ALVIN	5/10/1999	0	1	$ 200,000.00
ALVIN	5/2/2000	0	0	$ 15,000.00
ALVIN	7/23/2000	0	0	$ 15,000.00
ALVIN	3/14/2001	0	0	$ 15,000.00
ALVIN	11/23/2004	0	0	$ 3,000.00
ALVIN	4/21/2006	0	0	$ 10,000.00
ALVIN	5/14/2006	0	0	$ 10,000.00
ALVIN	4/17/2015	0	0	$ 5,000.00
Countywide	1/22/2017	0	0	$ 1,500.00
ALVIN	3/29/2018	0	0	0
ALVIN	10/31/2018	0	0	0

*Countywide damages are estimated at $500,000, however, the majority of that amount was from roof damage in Alvin.

The majority of these events with property damage reported caused downed trees and in some cased downed powerlines. The event on May 10, 1999 destroyed one mobile home and damaged several others. A car was also overturned.

Future Occurrence
The City of Alvin has experienced 15 high wind events between 1993and 2019, causing an estimated $296,500 in property damage. Calculations involving 15 events reported over 27 years, suggest a high wind event occurs approximately every other year on average. Consequently, there is a 55% chance of a severe thunderstorm and high wind event in any given year.

Extent

The most widely accepted descriptive wind scale is the Beaufort Wind Scale shown in Table 3-34. 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 Alvin can expect to experience wind events ranging from light winds to hurricane force winds.

Table 3-34 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 uprooted, "considerable structural damage"

			foam, heavy rolling, lowered visibility		
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 Alvin, most wind damage has been limited to downed trees, debris-blocked roads, and disabled power lines with the occasional roof and mobile home damage. The City of Alvin has experienced severe thunderstorms and high winds up to 60 Knots. However, winds up to 73 Knots have been experienced nearby within the County and similar events could affect Alvin 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.

Vulnerability

According to the NCEI, there have been 15 severe thunderstorm and high wind events within the City of Alvin. Mobile and manufactured homes are most susceptible to high wind damage as they are easily displaced or overturned in high wind. City records indicate there are 1,087 mobile and manufactured homes within mobile home and RV parks, comprising approximately 13.7% of buildings in the City. The City has an early warning system via the Everbridge Mass Notification System. Everbridge automatically relays severe weather alerts from the National Weather Service through text, voice (landlines, VOIP and cell) email and social media (Facebook and Twitter). The debris accumulation from downed trees and damaged structures that are associated with a high wind events can impact roads and impede emergency responders, hindering their ability to respond to calls for assistance. Additionally, utility interruption can occur from downed power lines causing an interruption in service to residents and critical infrastructure. This can degrade critical services and impede or eliminate the ability of critical facilities to satisfy demand for service. The City also has Everbridge Alerts which they encourage residents to get connected through text messages, emails, and phone calls, as well as tailored messaging for every member of the family. Everbridge is also used for mass communications and allows public alerting via geo-addressing with listed telephone numbers and can also alert specific communities, blocks or the entire City.

Tornadoes

Update from Last Plan

- Events since 2015, 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.

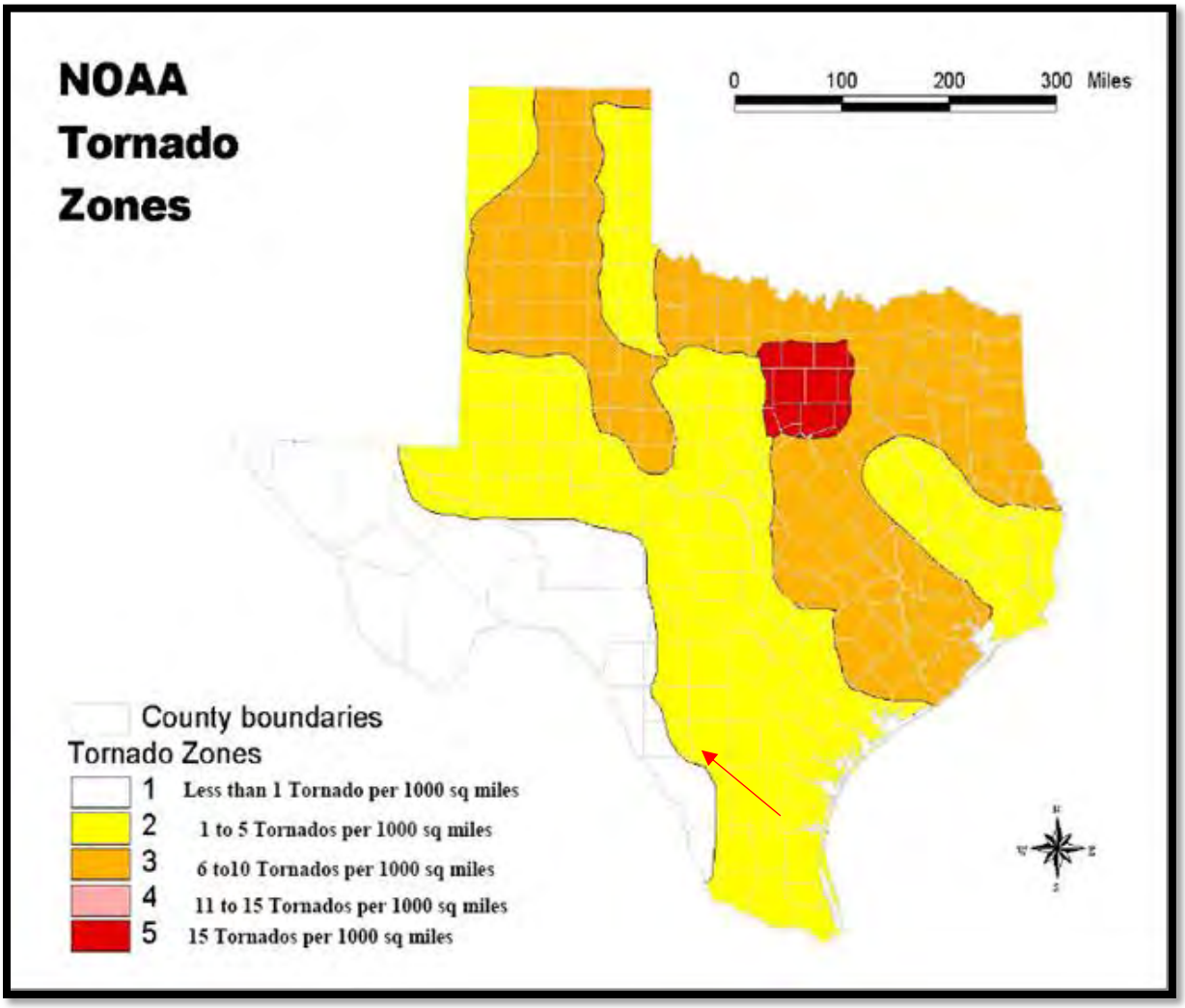
Hazard Description

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 AF illustrates the frequency of tornado strikes in Texas per 1,000 square miles, the arrow denotes the approximate location of Alvin, which falls within the zone for 1-5 tornadoes in a 1,000 square mile per the NOAA Prediction Center Map. With an average of 153 tornadoes touching down each year, Texas is considered the U.S. "tornado capital." 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 Alvin, although events at the lesser end of the scale are much more likely. Northern Texas is most vulnerable, but the area around Alvin experiences considerable activity. The tornado hazard affects the entire planning area approximately equally. All structures in the City 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.

Figure AF - 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 1950 and 2019, Brazoria County experienced 92 tornados, however some were reported multiple times in the database. However, looking at the narratives, there were ten tornado events that impacted the City of Alvin. For these events, the NCEI database reported no fatalities and 25 injuries and a total of $600,000 in damages. Table 3-35 summarizes the ten tornadoes that have occurred in the City of Alvin, no tornadoes have occurred since the last version of this Plan.

Table 3-35 - Tornadoes within the City of Alvin 1950 - 2019
(Source: NOAA/NCEI)

Location	Date	Mag	Deaths	Injuries	Property Damage
Alvin to Webster	02/11/1950	F2	0	0	$25,000*
Alvin	03/17/1957	F1	0	0	$250,000
Alvin	08/11/1970	F1	0	0	$2,500
Alvin	05/12/1972	F1	0	0	$2,500
Alvin	03/08/1976	F1	0	18	$250,000
Alvin	09/26/1976	F1	0	0	$0
Alvin	09/06/1980	F0	0	0	$0
Alvin	03/16/1983	F1	0	7	$25,000
Alvin	08/18/1983	F0	0	0	$0
Alvin	08/30/2001	F0	0	0	$45,000
				25	$600,000

*It is unclear whether the damage occurred in Alvin, Webster or in between during the February 1950 event.

The NCEI database is not complete, but continues to add more information which makes the historic events reported for just the City of Alvin more accurate. The two events with injuries reported, show no injuries in the database, but a narrative description of events show injuries. The narratives for the events with injuries are as follows.

March 17, 1975: A tornado touched down briefly in downtown Alvin, damaging a lumber yard and three other commercial buildings associated with the above system. 18 injuries were listed, but not described.

March 16, 1983: A thunderstorm moving eastward in advance of a cold front from Fort Bend County produced a small tornado as it approached Alvin, in Brazoria County. It struck one mobile home and rolled it with two occupants inside. It then struck a second mobile home with five persons inside and rolled it. All persons sustained only minor cuts and bruises. The tornado then lifted and died.

Future Occurrence
The City of Alvin has experienced ten tornadoes between 1950 and 2019, causing an estimated $600,000 in property damage. These ten tornado events were assessed as three F0 tornadoes, with six assessed as F1s and one assessed as an F2. Calculations based on ten events reported over 70 years suggest the City of Alvin experiences a tornado event approximately every 7 years, on average. Therefore, there is a 14.3% chance of a tornado event in any given year.

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 3-36

describes the categories for the Enhanced Fujita Tornado Scale. Alvin can expect to experience a tornado ranging from EF0 to EF5 in the planning area.

Table 3-36 - 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.

The Fujita Scale (F-Scale) was used until the Enhanced Fujita (EF-Scale) was created in 2007. It is provided as some of the occurrences were measured using the F-Scale.

Category	Wind Speed	Examples of Possible Damage
F0	Gale (40-72 mph)	Light damage. Some damage to chimneys; break branches of trees; push over shallow rooted trees; damage to sign boards.
F1	Moderate (73-112 mph)	Moderate damage. Peel surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads.
F2	Significant (113-157 mph)	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F3	Severe (158-206 mph)	Severe damage. Roofs and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.
F4	Devastating (207-260 mph)	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible (261-318 mph)	Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile sized missiles fly through air in excess of 100 yards; trees debarked; incredible phenomena will occur.

Impact
In Alvin, most wind damage has been limited to downed trees, blocked roads, and disabled power lines with the occasional roof damage. Historically, the City of Alvin has experienced tornadoes limited to EF0-EF2 strength. However, tornadoes up to EF3 have been experienced nearby within the County and similar events could affect Alvin in the future. 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 ten tornadoes within the City of Alvin, three F0s, six F1s and one F2. Mobile and manufactured homes are the most susceptible to tornado damage as they can be easily displaced or overturned in high winds. City records indicate there are1,087 mobile and manufactured homes within mobile home and RV parks, comprising approximately 13.7% of buildings in the City.

The City has an early warning system via the Everbridge Mass Notification System. Everbridge automatically relays severe weather alerts from the National Weather Service through text, voice (landlines, VOIP and cell) email and social media (Facebook and Twitter).

The debris accumulation from downed trees and damaged structures that are associated with high wind events can impact roads and impede emergency responders, hindering their ability to respond to calls for assistance. Additionally, utility interruption can occur from downed power lines causing an interruption in service to residents and critical infrastructure. This can degrade critical services and impede or eliminate the ability of critical facilities to satisfy demand for service.

Winter Storm

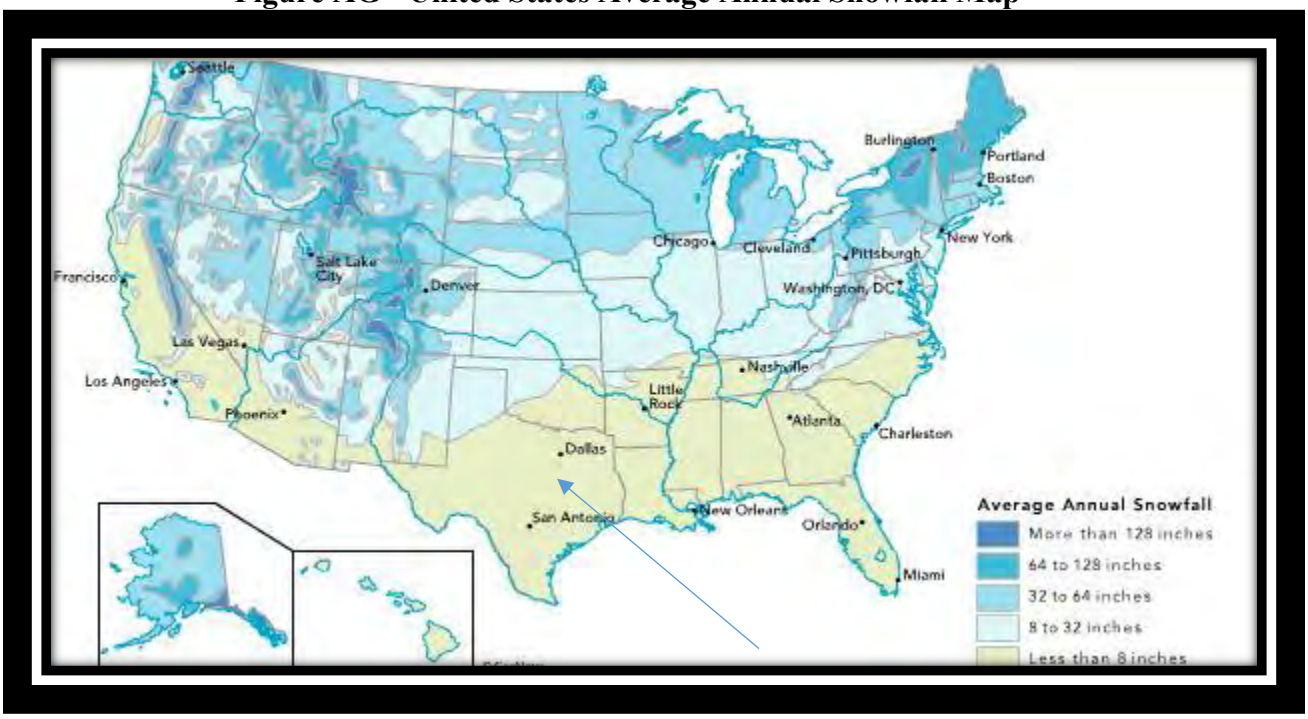
Update from Last Plan

- Events since 2015, were updated and described.
- No longer called Wildland Fire, updated to Wildfire
- 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 – Winter Storm
Winter storms bring various forms of precipitation that occur only at cold temperatures, such as snow, sleet, or a rainstorm where ground temperatures are cold enough to allow icy conditions. These cold weather storms can also take the form of freezing rain or a wintry mix. A winter storm is defined as "the occurrence of hazardous winter weather due to a variety of elements, occurring either independently or in combination, including freezing rain, sleet, snow, ice and windy conditions that may contribute to low wind chill temperatures." Accumulations of sleet, snow and/or ice may render roads impassable and trigger utility outages. Heavy snowfall and extreme cold can immobilize an entire region. Even areas that normally experience mild winters can be hit with a major snowstorm or extreme cold. Winter storms can result in flooding, storm surge, closed highways, blocked roads, downed power lines and hypothermia. For additional information about winter storms visit NOAAs Hydro meteorological Prediction Center page located at http://www.hpc.ncep.noaa.gov/wwd/winter_wx.shtml.

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 the City of Alvin, 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 the City of Alvin 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 City and County. All people and assets are considered to have the same degree of exposure. Figure AG shows the average annual snowfall totals for the United States. The map shows southeastern Texas receives less than eight inches of snow per year.

Figure AG - United States Average Annual Snowfall Map



Previous Occurrence

For Brazoria County as a whole the NCEI reports there have been two ice events between 1950 and 2020. Although the query results begin in 1950 the first reported event is in 1997. It is unclear why the database does not include any events prior to 1997, although presumably occurrences prior to this date follow the same pattern as found in the NCEI list. The first storm in the NCEI list was a Freezing rain/sleet event occurring on the 12th-13th of January 1997. Trees, power lines and roadways were all effected. The weight of the ice caused trees and power lines to snap/fall. Glazed roadways posed hazardous driving conditions. Over 1100 traffic accidents were reported in Southeast Texas which accounted for three deaths. Estimated damage was set at $800,000. From review of the NCEI description is uncertain what portion (if any) of the damages occurred in Brazoria County, but damage amounts for the County are listed at $0. None of the injuries occurred within Brazoria County. The second event was on December 4, 2009. Snow accumulations of between 1 to near 3 inches occurred across the northern tier of the county. West Pearland reported the highest snow accumulation of around 2.5 inches. The third event occurred on February 3, 2011. A period of freezing rain and freezing drizzle led to icy roads, especially bridges and overpasses, and numerous accidents. Between one and two tenths of an inch of ice accumulated. The final event occurred on January 28, 2014. Light snow was observed just to the west of the Alvin area. No accumulation was reported. None of these events cause any damage, loss of life or injuries (Table 3-37).

Table 3-37 Winter Storms and Ice Storms within Brazoria County 1950 - 2019 (Source: NOAA/NCEI)

Location	Date	Type	Deaths	Injuries	Property Damage
Brazoria County	1/12/1997	Ice Storm	0	0	$0
Brazoria County	12/04/2009	Winter Storm	0	0	$0

Brazoria County	2/03/2011	Ice Storm	0	0	$0
Brazoria County	1/28/2014	Winter Storm	0	0	$0
			0	**0**	**$0**

Future Occurrence

Future probability is based in part on historical data. Given that there are only four records with no historical building or property damage in Brazoria County as a result of Winter Storms, the future probability of a winter storm is Low.

Extent

The City of Alvin'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 Figure AH), the City of Alvin planning area could expect to fall within a 0-2 ice damage index range.

Figure AH – 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 of the City and the County 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 city and county 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. The City of Alvin is in a climatic region that is unlikely to experience snow depths sufficient to cause significant property damage such as collapsed roofs. The NCEI reports there has been no property damage from past winter storms (four events total) in Brazoria County. The NCEI database also indicated there has been no injuries and no deaths due to snow and ice conditions. The winter storm hazard affects all residential and commercial building types about equally within the planning area.

Vulnerability
In the City if Alvin's subtropical climate, winter storms that damage property are rare. During cold periods, however, the weather is often volatile, changing from warm and sunny to freezing in just a few hours. The severity of extreme cold temperature events is measured by temperature, duration, and humidity. Most events are less than a week in duration but can occasionally last for longer periods up to several weeks. An extreme cold event with temperatures in the single digits and wind chills below zero are possible in Brazoria County and the City of Alvin. Normally, the mercury falls below freezing about 10 to 15 times each winter, but rarely are readings lower than 25 degrees experienced. The record low temperature for the City of Alvin is eight degrees Fahrenheit on December 24th, 1989. Although somewhat rare, ice storms have impacted the city in the past. The close location of 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. The City can handle small amounts of ice accumulation; however, when 1/4 inch or more of ice accumulates on roads, freeways, power lines and trees, travel is paralyzed across the City and County with many thousands of homes experiencing electrical failures resulting in the loss of their heating systems. Everbridge will be used to notify residents of potential winter storm events.

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 City updated its critical infrastructure list to better assess what, exactly, is at risk. Using this information and the most recent experience of Hurricane Harvey, the City 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

Summary of 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 and the most recent experience of Hurricane Harvey, the City ranked the hazards and developed actions to help mitigate those hazards. The ranking list is in Table 3-38.

Table 3-38 - Hazard Ranking

Hazard	Rank (HIGH MEDIUM LOW)
Hurricane/Tropical Storms	High
Flood	Medium/High
Extreme Heat	Medium/High
Thunderstorms/High Wind	Low
Tornadoes	Low
Drought	Low
Hailstorms	Low
Winter Storm	Low

Section 4 – MITIGATION STRATEGY

Update from Last Plan

- Removed detailed section of FEMA and State of Texas Goals
- Streamlined the City's mitigation goal and revised the 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

The City of Alvin 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 City of Alvin mitigation planning strategy is to:

- Develop and maintain a comprehensive understanding of risks in the City
- 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
- Maintain good standing in the National Flood Insurance Program
- Seek additional ways to integrate hazard mitigation into City 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 City'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 goal of this plan is to support the City'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 City will work to:

- Minimize and prevent damage to public and private buildings and infrastructure
- Reduce risk from flood through flood reduction projects, land use and floodplain policies and increased participation in NFIP and CRS by the community
- Reduce economic losses
- Increase cooperation and coordination among private entities, local agencies, State agencies and Federal agencies
- Increase education, outreach, and awareness
- Protect natural resources

Status of Actions from the Current Approved Mitigation Plan

The approved 2016 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 16 action items. There were ten high priorities and six medium priorities. Seven of those actions have been completed, three hazards are being removed (due to omission of hazards dam failure and wildfire). These actions are highlighted grey in the table. Six actions will be reassessed and re-prioritized with the new 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 2015 Plan

Mitigation Actions in Current Plan	Update on Status Recommendation
Mitigation Action No. 1 - Acquire flood-prone homes in floodways – The majority of RL/SRL properties for the City are located along the Mustang Bayou, which are a top priority. There are also other RL/SRL properties in other various floodplains that the City would like to acquire. Removing the structures in a coordinated, voluntary and non-checker board way is a top priority for the City. Hazard(s) Addressed: Flood Priority: High Estimated Cost: $4,973,000	Update: Received a Flood Mitigation Assistance (FMA) FY 2013 grant for the purchase and demolition of two properties (RL or SRL) FMA 2013 grant Issues: checker boarding, funding and staff support Recommendation: Work is ongoing. Will move to 2020 Actions
Mitigation Action No. 2 - Elevate flood-prone homes Hazard(s) Addressed: Flood Priority: High Estimated Cost: $1,000,000	Update: No longer a priority for the City Issues: funding Recommendation: Removing from actions
Mitigation Action No. 3 – Construct detention ponds in Mustang Bayou Watershed and in Dickinson Bayou Watershed. Hazard(s) Addressed: Flood Priority: High Estimated Cost: $4,000,000	Update: No longer a high priority Issues: No longer pursuing in short term Recommendations: Will keep action but moved to a low priority
Mitigation Action No. 4 - Improvement projects: M-1 Ditch improvements. – Purchase 5 and 15 acre tracts for regional detention pond. Study has been completed, City is working to hire and engineer for implementation and would like construction to take place by the end of 2015.	Update: Substantially complete. The City completed the land purchase to complete two detention ponds. The detention ponds have been constructed and are complete. The City in moving on to storm sewer improvements that connect to these ponds.

Mitigation Actions in Current Plan	Update on Status Recommendation
Hazard(s) Addressed: Flood Priority: High Estimated Cost: $2,000,000	Recommendations: As the storm sewer improvements projects are part of the 2020-2024 Capital Improvement Program and being funded, it is considered complete for this plan.
Mitigation Action No. 5 - Implement drainage improvements in Dickinson Bayou Watershed Hazard(s) Addressed: Flood Priority: High Estimated Cost: $1,000,000	Update: Not completed Issues: Other watersheds cause greater flooding issues than Dickinson Bayou, therefore a low priority. Funding. Recommendation: Will keep action however, priority must be re-assessed.
Mitigation Action No. 6 - Join CRS program Hazard Addressed: Flood Priority – Medium Estimated Cost: 25,000	Update: Not completed. Issues: The City submitted an application, but it never moved forward. Will resubmit. Recommendation: Will keep action and will resubmit. Priority must be re-assessed. Estimated cost - $25,000
Mitigation Action No. 7 - Purchase generators for lift stations. Hazard(s) Addressed: Coastal Storm (Hurricane and Tropical Storms), Tornadoes, Thunderstorms/winds, Hail, Winter storms, Dam Failure, Wildfire, Extreme Heat Priority: High Estimated Cost: $1,000,000	Update: Complete. The 5 major lift stations now have generators. Recommendation: Complete
Mitigation Action No. 8 - Upgrade electrical systems at lift stations, install transfer switches, and relocate above base flood elevation. Hazard(s) Addressed: Coastal Storm (Hurricane and Tropical Storms), Flood, dam failure Priority: High Estimated Cost: $250,000	Update: Complete. The primary lift stations and the 39 secondary lift stations have upgraded electrical systems and transfer switches. Recommendation: Complete
Mitigation Action No. 9 - Acquire two 55 KW trailer mounted generators for emergency power various City infrastructure. Hazard(s) Addressed: Coastal Storm (Hurricane and Tropical Storms), Flood, Tornadoes,	Updates: Complete. The City of Alvin Police Department acquired two 55 KW trailer mounter generators. Recommendation: Complete

Mitigation Actions in Current Plan	Update on Status Recommendation
Thunderstorms/winds, Hail, Winter storms, Dam Failure, Wildfire, Extreme Heat Priority: High Estimated Cost: $200,000	
Mitigation Action No. 10 - Install hurricane shutters on Public Works and Emergency Shelter Facility. Hazard(s) Addressed: Coastal Storm (Hurricane and Tropical Storms) tornado, hail, high wind Priority: Medium Estimated Cost: $50,000	Update: Not completed. Issues: Funding. Recommendation: Will add to new actions and will also add obtaining a generator for temporary emergency shelter. Priority will be reassessed.
Mitigation Action No. 11 – Provide and maintain defensible space around structures vulnerable to wildfires. Hazard(s) Addressed: Wildfire Priority: High Estimated Cost: To Be Determined	Update: After hazard profile was completed, the hazard has been omitted Recommendation: Remove action as wildland fires has been removed as a hazard for Alvin.
Mitigation Action No. 12 - Develop Storm water Management Plan as well as a Master Drainage Plan and Implement Recommendations from Plans Hazard(s) Addressed: Flood Priority: High Estimated Cost: $190,000	Update: City is a member of the Brazoria County Storm Water Quality Coalition since 2016 so that part of the action is complete. Master Drainage Plan still needs to be complete. Issue: Funding Recommendation: Will add to new actions, priority to be reassessed. Increase cost to $300,000
Mitigation Action No.13 - Develop distribution centers in local libraries, government facilities, and other public buildings where information and safety guidance on natural and manmade hazards and how to mitigate hazards can be provided to citizens. Hazard(s) Addressed: Coastal Storm (Hurricane and Tropical Storms), Tornadoes, Flood, Wildfire, Dam Failure, Drought, Winter Storms, Hail, Extreme Heat Priority: Medium Estimated Cost: $1,000	Update: Complete. While not a "physical distribution center", Education awareness materials have been moved to social media platform as well as an annual Hurricane and Disaster preparedness mailing and quarterly newsletters and water bills. Recommendation: Complete

Mitigation Actions in Current Plan	Update on Status Recommendation
Mitigation Action No.14 - Due to the data deficiency identified as part of the Dam Failure Risk Assessment, work with TCEQ, and private Dam owners (where possible) to Conduct a study, to identify dam inundation areas for all high hazard dams in the planning area. When and if available, this data will be used for the next plan update to complete a more thorough risk assessment, to include extent and impact of potential dam failures. Hazard(s) Addressed: Dam Failure and Flood Priority: Medium Estimated Cost: Minimal costs, staff time only as the development of inundation maps is the responsibility of the TCEQ and/or private Dam owners.	Update: After hazard profile was completed, the hazard has been omitted. Recommendation: Remove action as there are no dams within at least of 60 miles radius of Alvin with no threat of a hazard, dam failure has been removed as a hazard for Alvin.
Mitigation Action No. 15 - Coordinate with the State to monitor and conserve existing water supplies in the City. Install additional water storage facilities to compensate during drought conditions. Hazard(s) Addressed: Drought Priority: Medium Estimated Cost: Minimal costs, staff time only	Update: The City prepared a drought contingency plan to support monitoring and conservation of water. It also added additional water storage some at grade and some elevated. 1.5 million gallons. Recommendation – Complete
Mitigation Action No. 16 - Enforce water restrictions during times of drought Hazard(s) Addressed: Drought Priority: Medium Estimated Cost: Minimal costs, staff time only	Update: In addition to a drought ordinance that can impose fines on violators of water restrictions, the City prepared a drought contingency plan that has multiple staged trigger points for water restrictions – each identifies more stringent restrictions on water use as drought/extreme heat continues. Recommendation: Complete

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 1-19; Medium is defined as 20-39; and High is defined as 40-60. The results are depicted in Tables4-2 and 4-3. Table 4-2 lists the action by mitigation type (e.g. Education and Awareness) and provides the hazard(s) addressed. Table4-3 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 75 TOTAL SCORE BETWEEN 1-25 HAZARD IS LOW PRIORITY (L) TOTAL SCORE BETWEEN 26-50 HAZARD IS MEDIUM PRIORITY (M) TOTAL SCORE BETWEEN 51-75 HAZARD IS HIGH PRIORITY (H)	Total	Priority	Addressed Hazard DR: Drought EH: Extreme Heat F: Flood Hail: HAIL H/TS: Hurricane/TS TH/HW: Thunderstorm/ High Wind T: Tornadoes W: Winter storm
Education and Awareness			
Establish a pilot program with schools and senior center for hazard awareness campaign	62	H	All hazards
Improve the residential sign up rate for Everbridge alerts	73	H	T/ TH/HW/D/EH
Educating cities that all fuel burning equipment should be vented to the outside, and to install carbon monoxide monitors and alarms	43	M	H/TS and W
Structure/Infrastructure			
Purchase of a permanent generator for the Temporary Emergency Shelter	63	H	EH/F/H/TS/T
Install hurricane shutters on Public Works and Emergency Shelter Facility. (moved from current to new)	49	M	H/TS/TH/HW/T
Develop Master Drainage Plan and Implement Recommendations from Plans (moved from current to new)	61	H	F/H/TS
Lift Station 2 - Rehabilitation of the electrical equipment and performing structural repair of slab	61	H	F
Purchase additional flood gauges to be placed at bayous and key high water areas within City	59	H	F/H/TS
Purchase additional rain gauges to be placed at water plants and lifts station sites	54	H	F/EH/H/TS
Install additional covered parking for city vehicles and equipment	53	H	H/TH/HW/T
Construct Detention ponds in Mustang Bayou Watershed and in Dickinson Bayou Watershed (moved from current to new)	65	H	F/H/TS
Installation of a wastewater supervisory control and data acquisition (SCADA) system to be connected to the operation of the peak flow basin.	60	H	F/H/TS
Low-flow Toilet Installation for New City Construction	38	M	DR
Natural Systems Protections			
Pursue open space preservation with within adjacent development, dedication of conservation easements or fee simple acquisition of land along Mustang Bayou	59	H	F/H/TS
Acquire SRL and RL Properties (moved from current plan to new actions)	61	H	F/ H/TS
Initiatives			
Hire a dedicated, full- time Floodplain administrator who can support the CRS application, community NFIP and flood plain support	49	M	F/H/TS
Hire a grant expert/HAZUS expert to help City apply for various funding opportunities	49	M	All hazards
Local Plans (studies/reports)/Regulations			
Apply to the CRS (high) (moved from current to new)	62	H	F/ H/TS
Develop a single, unified land development code	47	M	F
Sanitary Sewer Evaluation Survey to be conducted through the Southern Basin	59	H	F
Study the Dickinson Bayou watershed (moved from current to new)	62	H	F/H/TS

Table 4-3 - Mitigation Action Summary of Prioritization

Action No.	MITIGATION ACTION SUMMARY OF PRIORITIZATION TOTAL SCORE BETWEEN 1-25 HAZARD IS LOW PRIORITY (L) TOTAL SCORE BETWEEN 26-50 HAZARD IS MEDIUM PRIORITY (M) TOTAL SCORE BETWEEN 51-75 HAZARD IS HIGH PRIORITY (H)	Total	Priority
1	Establish a pilot program with schools and senior center for hazard awareness campaign	61	H
2	Improve the residential sign up rate for Everbridge alerts	65	H
3	Purchase of a permanent generator for the Temporary Emergency Shelter	60	H
4	Develop Master Drainage Plan and Implement Recommendations from Plans (moved from current to new)	55	H
5	Lift Station 2 - Rehabilitation of the electrical equipment and performing structural repair of slab	53	H
6	Purchase additional flood gauges to be placed at bayous and key high water areas within City	56	H
7	Purchase additional rain gauges to be placed at water plants and lifts station sites	51	H
8	Install additional covered parking for city vehicles and equipment	50	H
9	Construct Detention ponds in Mustang Bayou Watershed and in Dickinson Bayou Watershed (moved from current to new)	57	H
10	Installation of a wastewater supervisory control and data acquisition (SCADA) system to be connected to the operation of the peak flow basin.	52	H
11	Pursue open space preservation with within adjacent development, dedication of conservation easements or fee simple acquisition of land along Mustang Bayou	50	H
12	Acquire SRL and RL Properties (moved from current plan to new actions)	53	H
13	Apply to the CRS (high) (moved from current to new)	57	H
14	Sanitary Sewer Evaluation Survey to be conducted through the Southern Basin	51	H
15	Study the Dickinson Bayou watershed (moved from current to new)	54	H
16	Educating cities that all fuel burning equipment should be vented to the outside, and to install carbon monoxide monitors and alarms	42	M
17	Install hurricane shutters on Public Works and Emergency Shelter Facility. (moved from current to new)	48	M
18	Hire a dedicated, full- time Floodplain administrator who can support the CRS application, community NFIP and flood plain support	44	M
19	Hire a grant expert/HAZUS expert to help City apply for various funding opportunities	44	M
20	Develop a single, unified land development code	39	M
21	Low-flow Toilet Installation for New City Construction	38	M

New Mitigation Actions

The City has 21 actions for this iteration of the plan and information regarding each action is described in The Mitigation Action Table 4-4.

Table 4-4 Alvin Mitigation Actions

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

Action #1

Title: Improve the residential sign up rate for Everbridge Alerts			
Hazard	Description/Issue	Implementing Department	
Hail Extreme Heat Flood Hurricane/TS T'storm/HW Winter Storm	Everbridge is the City's system to provide real time information to citizens on a hazard. The City will prepare a sign up campaign with the goal to reach every citizen.	Emergency Management	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $5,000 Funding: CIP, Grants	2020-2025	H	A
Cost and Benefits Considerations			
Cost is for mailings, employee time, brochures, call campaign to get all citizens signed up.			

Action #2

Title: Construct detention ponds in Mustang and Dickinson Bayou			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Construct detention ponds in Mustang and Dickinson Bayou watersheds	Engineering Department	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: 4,000,000 Funding: CIP, Grants	2020-2025	H	A/B
Cost and Benefits Considerations			
Cost is for surveying and construction, benefit is the protection of roads and some structures from nuisance flooding.			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #3			
Title: Purchase of a permanent generator for the Temporary Emergency Shelter			
Hazard	Description/Issue	Implementing Department	
Extreme Heat Flood Hurricane/TS Tornadoes	Purchase of a permanent generator, pad and fuel tank, lines and necessary equipment for the City's Temporary Emergency Shelter	Public Services	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $25,000-$75,000 Funding: Grants, operating budget	2020-2025	H	A
Cost and Benefits Considerations			
Cost is based on the size and type of generator for the size of the building. Benefit is the protection of Alvin citizens to provide shelter during a hazard emergency.			

Action #4			
Title: All Hazard Awareness Campaign			
Hazard	Description/Issue	Implementing Department	
Drought Extreme Heat Flood Hail Hurricanes/TS T'storms/High Wind Tornadoes Winter Storm	Establish a hazard awareness campaign pilot program to educate schools and seniors on mitigation actions they can implement.	Emergency Management	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $15,000 Funding: Grants, donations, capital budget	2020-2025	H	A/B
Cost and Benefits Considerations			
Cost is employee time to start and maintain program and preparing, updating and printing materials.			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #5			
Title: Apply to Community Rating System (CRS)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Apply and once accepted maintain and/or improve CRS status.	Engineering	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $25,000 Funding: Operating budget	2020-2025	H	A/B
Cost and Benefits Considerations			
Cost is time, data and preparation of a CRS application. Benefit, if approved homeowner with flood insurance could receive a discount based on the City's CRS score.			

Action #6			
Title: Study Dickinson Bayou Ditch watershed			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Implement drainage improvements in the Dickinson Bayou Ditch	Engineering Department	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $350,000 Funding: Grants, CIP	2020-2025	H	A/B
Cost and Benefits Considerations			
Cost is to hire engineering firm for the study.			

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

Action #7			
Title: Develop Master Drainage Plan and Implement Recommendations from Plan			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Develop a Master Drainage Plan	Engineering Department	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $300,000 Funding: Grants, operating budget	2020-2025	H	A
Cost and Benefits Considerations			
Cost is based on the approximate cost to hire and engineering, hydrology, and surveying firm to support a comprehensive review of current drainage, studies and recommendations for future projects and studies.			

Action #8			
Title: Rehabilitation of Lift Station 2			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Lift Station 2 - Rehabilitation of the electrical equipment and performing structural repair of slab	Engineering Department	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $390,000 Funding: CIP Budget, Grants	2020-2025	H	A
Cost and Benefits Considerations			
Cost is based estimate for design and survey work and construction. Benefit is to increase the service life and reliability of an already built and working lift station instead of building a new one.			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #9			
Title: Acquire SRL and RL Properties (moved from current plan to new actions)			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Acquire homes that are designated Repetitive Loss (RL) or Severe Repetitive Loss (SRL) by FEMA	Engineering Emergency Management	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: Dependent upon number of homes and value of homes Funding: Federal Grants	2020-2025	H	A
Cost and Benefits Considerations			
Cost is difficult to determine without understanding how many homes and the market value of the homes. Benefit is to help homeowners with an option to move out of the RL/SRL structure and to the floodplain as the property would be required to be preserved as open space in perpetuity.			

Action #10			
Title: SCADA Installation			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Installation of a wastewater supervisory control and data acquisition (SCADA) system to be connected to the operation of the peak flow basin.	Engineering Pubic Services	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: 2,373,600 Funding: CIP, Grants	2020-2025	H	A/B
Cost and Benefits Considerations			
Cost is for design, surveying and construction, benefit would allow City Staff to optimize the operation of the wastewater system.			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #11			
Title: Purchase additional flood gauges			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Purchase additional flood gauges to be placed at bayous and key high water areas within City	Engineering Department Public Services	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $50,000-$75,000	2020-2025	H	A
Cost and Benefits Considerations			
Dependent on how many are being purchased			

Action #12			
Title: Pursue Open Space Preservation			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Pursue open space preservation with within adjacent development, dedication of conservation easements or fee simple acquisition of land along Mustang Bayou	Engineering	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: Parcel Dependent Funding: CIP, Grants	2020-2025	H	A/B
Cost and Benefits Considerations			
Cost is for the purchase of land along the Mustang Bayou. Benefit is protection of the watershed, the floodplain and structures nearby			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #13			
Title: South and Western Basin Sanitary Sewer Evaluation Survey			
Hazard	Description/Issue	Implementing Department	
Flood	Sanitary Sewer Evaluation Survey be conducted throughout the Southern and West Central Basin to identify sources of inflow and infiltration during wet and dry weather	Engineering Public Services	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $120,000 Funding: Operating Budget	2020-2025	H	A/B
Cost and Benefits Considerations			
Cost is design, survey and reporting. Benefit is determination of sources of inflow and infiltration identified so that solutions can be addressed.			

Action #14			
Title: Additional Rain Gauges			
Hazard	Description/Issue	Implementing Department	
Drought Flood Hurricane/TS	Purchase additional rain gauges to be placed at water plants and lifts station sites	Engineering Department	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $100,000 Funding: CIP Budget, Grants	2020-2025	H	A/B
Cost and Benefits Considerations			
Cost is based estimate for gauges, poles, radio frequency, repeaters and base station Benefit is have real time rainfall data at key high mark or flooding areas.			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #15			
Title: Installation of Covered Parking for City Vehicles and Equipment			
Hazard	Description/Issue	Implementing Department	
Hail Hurricane/TS T'storm/HW	INTAL additional covered parking for city vehicles and equipment	Engineering Department Public Services	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $75,000-$100,000 Funding: CIP Budget, Grants	2020-2025	H	A
Cost and Benefits Considerations			
Cost is based on approximate cost for past similar purchases.			

Action #16			
Title: Install Hurricane Shutters on Public Works and Emergency Shelter Buildings			
Hazard	Description/Issue	Implementing Department	
Hurricane/TS T'Storm/High Wind Tornadoes	Install Hurricane Shutters on two buildings that are used during hazard emergencies (PW building for employees) Emergency Shelter (for citizens)	Public Services	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $50,000 Funding: Grants, operating budget	2020-2025	M	A
Cost and Benefits Considerations			
Cost is based on the approximate cost with number of windows for buildings.. Benefit is the protection of Alvin citizens and employees to provide additional protection to the building that is sheltering during a hazard emergency.			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #17			
Title: Hiring Full Time Floodplain Administrator			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/TS	Hire a full-time floodplain administrator who can support CRS application, NFIP, mapping and community floodplain support	Engineering	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $75,000-$100,000 Funding: Operating budget	2020-2025	M	A/B
Cost and Benefits Considerations			
Cost is full time salary and benefits. Benefit is the job is currently handled by the Director of Engineering who has several responsibilities. A dedicated employee could help the community obtain CRS status and full time flood plain support in the hazard that has the greatest impact to the community.			

Action #18			
Title: Hire Grant/HAZUS Specialist			
Hazard	Description/Issue	Implementing Department	
All Hazards	Hiring a full time grant/HAZUS specialist to apply for grants to support the City's mitigation efforts against natural hazards	Engineering	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: Salary and Benefits Funding: Operating Budget	2020-2025	M	A/B
Cost and Benefits Considerations			
The cost of an employee with benefits. Benefits grants that could support multiple departments as well as plans and other documents required to apply for grants.			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #19			
Title: Development of Unified Land development code			
Hazard	Description/Issue	Implementing Department	
Flood	A unified land development code combines all land use controls into a single document with a logical structure that is user friendly	Engineering	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $100,000 Funding:	2020-2025	M	A/B
Cost and Benefits Considerations			
Cost is time, data and preparation of a unified land development code Benefit is a single, unified, non-conflicting code.			

Action #20			
Title: Fuel Burning Equipment and Carbon Monoxide Monitor Awareness			
Hazard	Description/Issue	Implementing Department	
Hurricane/TS Winter Storm	Educating citizens that all fuel burning equipment should be vented to the outside and installation of carbon monoxide monitors and alarms	Fire Department	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $5,000	2020-2025	M	A
Cost and Benefits Considerations			
Cost is for time for employee to prepare information and to obtain carbon monoxide alarms to give away in support of awareness program.			

Action #21			
Title: Low-flow Toilet Installation for New City Construction			
Hazard	Description/Issue	Implementing Department	
Drought	When the City plans for a new building, it will install low-flow toilets in these new facilities	Engineering	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: $400 per toilet	2020-On	M	B
Cost and Benefits Considerations			
Cost is for the estimated cost to purchase of new low-flow toilets.			

Section 5 - Plan Maintenance Process

Introduction

The plan maintenance section of this document details the formal process that will ensure that the City of Alvin 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 City will integrate public participation throughout the plan and implementation process and explain how the City plans to incorporate the mitigation strategies outlined in this plan into existing planning mechanisms.

Update from Last Plan

The Hazard Mitigation Plan Update is a collaborative process and while the Alvin Engineering Department will lead the efforts, Emergency Management coordinates mitigation efforts. The Engineering Director will appoint a member of the Engineering Team to be the designated lead 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 City 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 City 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 Hazard Mitigation Coordinator 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 City of Alvin will initiate Plan reviews and updates outside of the annual review:

- On the recommendation of the Hazard Mitigation Coordinator or on its own initiative, the City Council 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 City assets, operations and/or citizens.
- When activities of the City, or the State significantly alter the potential effects of natural hazards on Alvin 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 2020 Plan will enter its next review cycle sometime in 2024, with adoption of that update in 2025. 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 City Plans. The current hazard mitigation plan was reviewed to assess what data could be used for several City reports that were prepared from 2015-2019. Members of the MPC sit on the 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:

- 2015 City of Alvin Comprehensive Plan reviewed the plan to understand the actions against the current and future land use.
- City of Alvin Capital Improvements Program 2020-2024 reviewed the plan to identify subject areas where mitigation activities and principles can be incorporated. Staff responsible for the mitigation plan are directly involved with the capital improvement processes, and the City fully explores the possibility of expanding or adjusting potential

capital improvement projects to maximize mitigation effects (for example, by modifying a drainage project to address repetitive flood loss properties).

- City of Alvin Emergency Management Plan (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 Alvin's Engineering Design Criteria Manual Update (which includes the Storm water Management Plan) reviewed the ordinances discussed in the plan.
- Flood Insurance Rate Maps (FIRMs) and the preliminary maps. Alvin FIRMs were reviewed to assist with identifying areas vulnerable to flooding within the City.

As with all plans and capabilities that are in place, the City 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 City 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.

Additionally, as the City is reviewing the existing storm water and floodplain ordinances, the HMP and the other documents are utilized to assist in incorporating recommended changes. The process starts the year before the respective plan needs to be re-permitted and includes:

- Reviewing any changes in regulation;
- Reviewing the current plan; and
- Preparing the update.

As the City reviews the following documents 1) Comprehensive plan, 2) NPDES-MS4, 3) Community Rating System application, the review includes the incorporation of a review of the HMP. This review is to make sure that any changes or improvements are reviewed with these documents.

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

- 2017 State of Texas Mitigation Plan.
- Brazoria County Hazard Mitigation Plan

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 City's website) and on the Annual Progress Reports under the plan monitoring strategy described above.

Alvin 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 Council meetings will be undertaken.

APPENDICES

Update from Last Plan:

- Removed Brazoria County Conservation and Reclamation District #3 appendix plan
- Removed Acronym page
- Removed Key Terms
- Removed FIRM for Owned Facilities
- Removed Hazard descriptions
- Removed General description of hazard

APPENDIX A

Minutes from the MPC Meetings

City of Alvin Minutes
MPC Meeting 1
May 27, 2020
9:30 am CST

MPC Attendees

Attendee	Department
Michelle Segovia	City Engineer, Engineering Department, City of Alvin
Ron Schmitz	Emergency Management Coordinator and EMS Director, City of Alvin
Brandon Moody	Public Services Director, City of Alvin
Kristen Thatcher	Plan Consultant, JSWA
Dan Ward	Plan Consultant, JSWA

Introductions

Background and purpose of hazard mitigation plan (HMP)

- 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 2016, expires on 1/20/21.
- The 2020 plan update will be a single jurisdiction plan and will not include BCCRD3. BCCRD3 will be asked to be a stakeholder.

The plan update process

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

- Determine what has changed within the City (e.g. a new fire station and EMS building, land development) since 2015 (current plan data).
- 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
Michelle Segovia	City Engineer	Engineering	Data collection, analysis of hazards, identify actions Review drafts
Ron Rosenwald	GIS Coordinator	Engineering	Data collection, analysis of hazards, identify actions Review drafts Mapping support

Ron Schmitz	EMS and EM Director	Emergency Management	Data collection, analysis of hazards, identify actions Review drafts
Brandon Moody	Director	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

Identify Stakeholders (need list before next meeting – 6/10/20)
The Stakeholder group will be comprised of diverse interests including other government agencies, neighboring communities, business, 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
Friendswood		
Pearland		
Manvel		
Santa Fe		
Angleton		
Alvin ISD		
Alvin Community College		
Brazoria County		
Harris County		
BCC&RD3		
BDD4		
BDD5		
Other departments in Alvin		
Alvin/Manvel Chamber of Commerce		

Review Hazards from Last Plan
Using the overall 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 City or if the hazard occurs City-wide. While many of the hazards can and do affect the area, the MPC discussed at length the lack of dams in the area, historical occurrences, location of dams and last five year review of any inundation and concluded that while dam failure was profiled in the current plan, the team recommends the plan update omit dam failure and explain why it will be omitted. The team also reviewed Wildfire

and after review is going to discuss with the fire department to determine if the few grassfires that have previously occurred, warrant profiling the hazard or if it too should be omitted.
The team then reviewed two hazards that were not previously profiled – lightening and subsidence. The team discussed lightening and concluded that while it does occur in the area, impact is de Minimis and any actions to mitigate (e.g. critical facilities protecting by lightning rods protections, grounding of communications infrastructure, surge protection and educational awareness) 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. Drafts of the 2020 hazards will be prepared before the next meeting, 6-10-20.

Alvin 2015 Hazards	2020 Hazards Reviewed	2020 Hazards for Plan
Flood	Flood	**Flood**
Tornadoes	Tornadoes	**Tornadoes**
Severe Thunderstorms/High Wind	Thunderstorms – High Wind	**Thunderstorms – High Wind**
Coastal Storms (Hurricane/Tropical Storms)	Hurricanes and Tropical Storms	**Hurricanes and Tropical Storms**
Winter Storm	Winter Storm	**Winter Storm/Severe Winter Weather**
Wildfire	Wildfire	Review and Potentially Omit
Dam Failure	Dam Failure	Recommendation to Omit
Drought	Drought	**Drought**
Extreme Heat	Extreme Heat	**Extreme Heat**
Hail	Hail	**Hail**
	Lightning	Recommendation to Omit
	Land Subsidence	Recommendation to Omit

Discuss outreach strategy

The MPC needs input from diverse interests to help review and update mitigation strategy. The City 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 City to the Stakeholders will be sent to request their input to the draft, and how to provide that input back to the MPC.
b. Public Meeting 1 on July 16th. To ensure citizens understand what the community 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. These plans include:

City of Alvin 2035 Comprehensive Plan
City of Alvin Five Year Capital Improvement Program (2020-2024)
2016 Master Plan
M-1 Watershed Study (2011) and subsequent updates

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 – broken out by residential, commercial and Public/City buildings (if possible).

Schedule

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

Date	Description
5-27-20	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 Community facilities reviewed Discuss stakeholders
6-10-20	Current Actions updated finalized New Actions to be discussed Local capabilities finalized Local Development update finalized Community facilities finalized Finalize Stakeholders
6-17-20	New Actions finalized Plan maintenance process finalized Hazard Ranking, Actions finalized
7-8-20	Draft to MPC for review. Letter to stakeholders sent requesting input
7-16-20	First Public Meeting
7-29-20	Data collections and review. Comments from first public meeting incorporated; updating all sections after meeting
8-3-20	Letters to stakeholders drafted, second draft review
8-18-20	Stakeholders contacted regarding public meeting and providing process for providing comments from review
9-3-20	Second Public Meeting
9-4-20	Plan uploaded to City Website; Public given 30 days to review and provide comments
10-5-20	Comment cycle closes and comments incorporated
10-7-20	MPC meeting to review comments for incorporation
10-16-20	Plan is finalized to be sent to TDEM for review process

Mitigation Strategy
The team reviewed the Goal from Current Plan (The plan must include general hazard mitigation goals that represent what the jurisdiction seeks to accomplish through Mitigation plan implementation.) After review, the team determined the goal will be revised to not include objectives and strategy but provide high level goal for plan update. A draft will be circulated for review.

Other items
A request for information and documents was provided:
Describe Hazard impacts since last plan (2015-2020)

- Most hazards did not have much of an impact within these last five years with the exception of floods and hurricanes/Tropical storms.
- Tropical Storm Harvey – City will provide detail descriptions of impact

City will provide the following Maps:

- FIRM of the City or map of City with Floodplain overlay
- City buildings in relation to the floodplain
- RL properties in relation to the floodplain
- SRL properties in relation to the floodplain
- Both RL and SRL properties in relation to the floodplain

City will provide description of any grants received since the last version of the Plan.
City will provide rain gauge location data for the last 5 years and when the gauge was put in place.

ACTION ITEMS TABLE DUE ON OR BEFORE JUNE 10th

ACTION	TEAM MEMBER
Stakeholder information	MS
Hazard profile draft	DW
Provide requested studies	MS
Provide building data	Team
Circulate draft goal statement	KT
Maps	RR
Harvey Impact description	MS
Grants	MS
Rain Gauge data	BM

City of Alvin Minutes
MPC Meeting 2
June 10, 2020
9:00 am CST

MPC Attendees

Attendee	Department
Michelle Segovia	City Engineer, Engineering Department, City of Alvin
Ron Schmitz	Emergency Management Coordinator and EMS Director, City of Alvin
Ron Rosenwald	GIS Coordinator, Engineering Department, City of Alvin
Brandon Moody	Public Services Director, City of Alvin
Shana Church	Executive Secretary, Engineering Department, City of Alvin
Kristen Thatcher	Plan Consultant, JSWA
Dan Ward	Plan Consultant, JSWA

Finalize Stakeholders
The MPC finalized the stakeholder list with 14 organizations represented. The MPC will send out a letter inviting the stakeholders to participate in the process.

Update Actions from current plan
The Plan must describe the status of the mitigation actions identified in the current plan by describing those that have been completed or not completed. For actions that have not been completed, the plan must either describe whether the action is no longer relevant or indicate it is going to be included as part of the updated action plan and provide a status. The team reviewed the 16 actions items in the current plan and provided a status on each of them, reprioritizing them if necessary and omitting others.

Mitigation Strategy – Finalize Goal for plan update
The team further revised the current goal statement to be more streamlined. The team approved the 2020 goal as follows:
The goal of this plan is to support the City'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 City will work to:

- Minimize and prevent damage to public and private buildings and infrastructure
- Reduce risk from flood through flood reduction projects, land use and floodplain policies and increased participation in NFIP and CRS by the community
- Reduce economic losses
- Increase cooperation and coordination among private entities, local agencies, State agencies and Federal agencies
- Increase education, outreach, and awareness
- Protect natural resources

Review Hazard Descriptions
The MPC was given the first draft of the profiled hazard section with updated occurrences since 2015. Each hazard profile included the geographic location in the City, the magnitude and strength of the hazard using hazard specific scientific scales or measurement systems (extent), previous occurrences and probability of future events. With this information, the MPC determined which hazards are most significant to the City. The definitions the MPC used to populate the chart 1 are included in the worksheet 5.1. The populated table 1 is as follows:

Table 1 Hazards Summary Worksheet – City of Alvin

Hazard	Location	Maximum Probable Extent (Magnitude/Strength)	Probability of Future Event	Overall Significance Rating	Comments
Dam Failure	None in City	Weak	Unlikely	LOW - See Comments	Closest dam is at least 60 miles away. Inundation map from that dam shows no inundation in, near or around City - Will omit hazard
Drought	City-wide	Severe	Likely	LOW	Will include in plan update but lower priority actions.
Extreme Heat	City-wide	Moderate/Severe	Likely	MEDIUM/HIGH	Will include in plan update with higher priority actions.
Flood	City-wide	Moderate - rain event floods Severe - Hurr/TS event floods	Occasional	MEDIUM/HIGH	Will include in plan update with higher priority actions.
Hail	City-wide	Weak	Likely	LOW	Will include in plan update but lower priority actions.
Hurricane/Tropical Storm	City-wide	Severe	Likely	HIGH	Will include in plan update with higher priority actions.
Lightning	City-wide	Weak/Moderate	Likely	LOW - See Comments	While hazard occurs in City, the City has provided all necessary mitigation measures to protect infrastructure and provide awareness. Will omit as no additional actions will be needed.
Severe Wind	City-wide	Moderate	Highly Likely	LOW	Will include in plan update but lower priority actions.
Severe Winter Weather	City-wide	Weak	Likely	LOW	Will include in plan update but lower priority actions.
Tornado	City-wide	Moderate/Severe	Occasional	LOW	Will include in plan update but lower priority actions.
Wildfire	No WUI	Weak	Unlikely	LOW - See Comments	GIS map shows no Wildfire Urban Interface in City. Fire Department reports indicate in past five years grass fires that caused no damage and were extinguished quickly. Will omit hazard.

Worksheet 5.1

Hazard Summary Worksheet

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.

3 Cumulative meteorological drought and wet conditions: http://ncdc.noaa.gov/

4 Earthquake intensity and effect on population and structures: http://earthquake.usgs.gov

5 Earthquake magnitude as a logarithmic scale, measured by a seismograph: http://earthquake.usgs.gov

6 Hurricane rating based on sustained wind speed: http://nhc.noaa.gov

7 Tornado rating based on wind speed and associated damage: http://spc.noaa.gov

ACTION ITEMS TABLE FROM MAY 27TH MEETING STATUS

ACTION	STATUS
Stakeholder information	COMPLETED
Hazard profile draft	COMPLETED
Provide requested studies	PROVIDED
Provide building data	PROVIDED
Circulate draft goal statement	COMPLETED
Maps	PROVIDED
Harvey Impact description	PROVIDED
Grants	PROVIDED
Rain Gauge data	PROVIDED

Schedule

The next MPC meeting was scheduled for Wednesday, June 17th at 9:00 am CST. Using the assets at risks to the hazards (people, economy, built environment and natural environment), team was asked to work on new actions for hazards profiled. The Team will also discuss the community's capabilities.

City of Alvin Minutes
MPC Meeting 3
June 17, 2020
9:00 am CST

MPC Attendees

Attendee	Department
Michelle Segovia	City Engineer, Engineering Department, City of Alvin
Ron Rosenwald	GIS Coordinator, Engineering Department, City of Alvin
Brandon Moody	Public Services Director, City of Alvin
Shana Church	Executive Secretary, Engineering Department, City of Alvin
Kristen Thatcher	Plan Consultant, JSWA
Dan Ward	Plan Consultant, JSWA

Critical Facilities Review and Update
The MPC was provided the list of public facilities and critical facilities from the 2012 plan. RR will update and send to team.

Draft Letter to Stakeholders
The MPC was provided a draft letter to invite stakeholders to participate. MS will send out week of June 22nd.

Review City of Alvin Capabilities
The team discussed the City's current capabilities to help implement mitigation activities. From that review and using the following categories, the team identified areas to improve or add capabilities.

Discussion of Mitigation Actions
The team reviewed the following guidelines for actions:

a. The primary types of mitigation actions to reduce long-term vulnerability include (see chart 2 below):
   i. Local plans and regulations,
   ii. Structure and infrastructure projects,
   iii. Natural systems protection, and

iv. Education and awareness programs

b. If the hazard impacts the planning area, it must have two actions.

c. Actions that are not mitigation or that are to study, establish contracts, data collection, assessments, continue with existing procedures or jurisdiction responsibilities, or that were lacking enough information to tie them to mitigation activities that will reduce risk were not considered towards meeting the requirement.

The team then identified actions for the hazards profiled.

Action items

The table below describes the action item and the team member responsible for the action.

Action item	Team Member
Send out stakeholder letter	MS
Provide updated public and critical facilities lists	RR
Provide word documents of letter and lists to team	KT
Provide draft presentation week of July 1	KT
Circulate draft plan week of July 1	KT/DW

Schedule

The next MPC meeting is scheduled for Wednesday, July 8th at 9:00 am CST to review draft and prepare for first public meeting which will be an agenda item on the City Council July 16th meeting.

City of Alvin Minutes
MPC Meeting 4
July 8, 2020
2:00 pm CST

MPC Attendees

Attendee	Department
Michelle Segovia	City Engineer, Engineering Department, City of Alvin
Ron Rosenwald	GIS Coordinator, Engineering Department, City of Alvin
Ron Schmitz	Emergency Management Coordinator and EMS Director, City of Alvin
Brandon Moody	Public Services Director, City of Alvin
Shana Church	Executive Secretary, Engineering Department, City of Alvin
Kristen Thatcher	Plan Consultant, JSWA
Dan Ward	Plan Consultant, JSWA

Mitigation Action Prioritization

The MPC, using the evaluation criteria and definitions below, gave a numeric value one being lowest and 10 being highest for each criteria per hazard.

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?

The hazards were then placed in a mitigation type (see results table on page 2):

Education and Awareness
Structure/Infrastructure
Natural Systems
Local Plans/Regulations
Initiatives

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 75 TOTAL SCORE BETWEEN 1-25 HAZARD IS LOW PRIORITY (L) TOTAL SCORE BETWEEN 26-50 HAZARD IS MEDIUM PRIORITY (M) TOTAL SCORE BETWEEN 51-75 HAZARD IS HIGH PRIORITY (H)	Total	Priority	Addressed Hazard DR: Drought EH: Extreme Heat F: Flood Hail: HAIL H/TS: Hurricane/TS TH/HW: Thunderstorm/ High Wind T: Tornadoes W: Winter storm
Education and Awareness			
Establish a pilot program with schools and senior center for hazard awareness campaign	62	H	All hazards
Improve the residential sign up rate for Everbridge alerts	73	H	T/ TH/HW/D/EH
Educating cities that all fuel burning equipment should be vented to the outside, and to install carbon monoxide monitors and alarms	43	M	H/TS and W
Structure/Infrastructure			
Purchase of a permanent generator for the Temporary Emergency Shelter	63	H	EH/F/H/TS/T
Install hurricane shutters on Public Works and Emergency Shelter Facility. (moved from current to new)	49	M	H/TS/TH/HW/T
Develop Master Drainage Plan and Implement Recommendations from Plans (moved from current to new)	61	H	F/H/TS
Lift Station 2 - Rehabilitation of the electrical equipment and performing structural repair of slab	61	H	F
Purchase additional flood gauges to be placed at bayous and key high water areas within City	59	H	F/H/TS
Purchase additional rain gauges to be placed at water plants and lifts station sites	54	H	F/EH/H/TS
Install additional covered parking for city vehicles and equipment	53	H	H/TH/HW/T
Construct Detention ponds in Mustang Bayou Watershed and in Dickinson Bayou Watershed (moved from current to new)	65	H	F/H/TS
Installation of a wastewater supervisory control and data acquisition (SCADA) system to be connected to the operation of the peak flow basin.	60	H	F/H/TS
Natural Systems Protections			
Pursue open space preservation with within adjacent development, dedication of conservation easements or fee simple acquisition of land along Mustang Bayou	59	H	F/H/TS
Acquire SRL and RL Properties (moved from current plan to new actions)	61	H	F/ H/TS
Initiatives			
Hire a dedicated, full- time Floodplain administrator who can support the CRS application, community NFIP and flood plain support	49	M	F/H/TS
Hire a grant expert/HAZUS expert to help City apply for various funding opportunities	49	M	All hazards
Local Plans (studies/reports)/Regulations			
Apply to the CRS (high) (moved from current to new)	62	H	F/ H/TS
Develop a single, unified land development code	47	M	F
Sanitary Sewer Evaluation Survey to be conducted through the Southern Basin	59	H	F
Study the Dickinson Bayou watershed (moved from current to new)	62	H	F/H/TS

Mitigation Action detail review

The MPC then took each hazard and provided additional information including:

- More detailed description of the action/issue;
- Hazard that impacts the action/issue
- The Department responsible for implementation
- The potential cost estimate and funding mechanism
- The potential time frame for completion
- The priority level
- If the hazard * A= Actions reducing risk to existing buildings and infrastructure
  * B= Actions reducing risk to new development or both
- Cost and Benefit considerations

Plan Maintenance Review

The team discussed how the City reviews this plan, how it works to integrate this plan into other plans and uses others plans information for this update and discussed how best to continue to monitor, evaluate and update the plan.

The team reviewed the first draft which included Sections 1-5 and provided comments and additional information requests were assigned.

Review of First Draft
The team will provide the remaining information by July 10th and it will be incorporated and the second draft will be provided to the MPC on July 13th.

Schedule
The MPC is scheduled on the July 16th Council Meeting to review the draft with the Council and Public.
The next MPC meeting is scheduled for Wednesday, July 29th CST to review second draft and to finalize this draft to be sent to Stakeholders.

City of Alvin Minutes
MPC Meeting 5
July 29, 2020
2:00 pm CST

MPC Attendees

Attendee	Department
Michelle Segovia	City Engineer, Engineering Department, City of Alvin
Ron Schmitz	Emergency Management Coordinator and EMS Director, City of Alvin
Brandon Moody	Public Services Director, City of Alvin
Shana Church	Executive Secretary, Engineering Department, City of Alvin
Kristen Thatcher	Plan Consultant, JSWA
Dan Ward	Plan Consultant, JSWA

Review of Comments received from Public Meeting on 7-16-20
The MPC discussed the two questions raised during the meeting to determine incorporation.

Review of information needed to complete draft
The team worked through the outstanding information requests on the call. The draft is now complete other than updating table and figure numbers and table of contents. The third draft will be sent to the MPC on or before July 31st.

Draft of Second Stakeholder letter
The team reviewed the second draft letter and the process for sending the letter to the stakeholders with the draft plan on the City's Dropbox Link. The letters will be sent on or before August 3rd and will request return by August 31st.

Second Public Meeting
The team worked on a draft public notice for the September 3rd Council Meeting which will present the draft plan to the public for 30-day review and comment period.

Schedule
The comment period will close on October 5th. The MPC will incorporate comments, review one last time and submit to TDEM to begin review process on or before October 16th.
The next MPC meeting is scheduled for October 7th to review comments provided to determine incorporation into plan and then finalize to submit to TDEM.

APPENDIX B

Stakeholder Letter to Participate

www.alvin-tx.gov

CITY OF ALVIN **Engineering Department**
1100 West Highway 6 • Alvin, Texas 77511 • (281) 388-4351 • FAX (281) 331-7516

June 23, 2020

Clay Pearson
City Manager
City of Pearland
3519 Liberty Dr.
Pearland, TX 77581

Re: The City of Alvin, Texas, Local Hazard Mitigation Plan Update

Dear Mr. Pearson:

As you may be aware, the City of Alvin, Texas is currently in the process of updating its FEMA Local 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 City as one that could be impacted by the mitigation actions and strategy and therefore, the City would like to invite you to be one of its stakeholders. If you accept, the City will send via a link, a draft to 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).

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

Sincerely,

Michelle H. Segovia

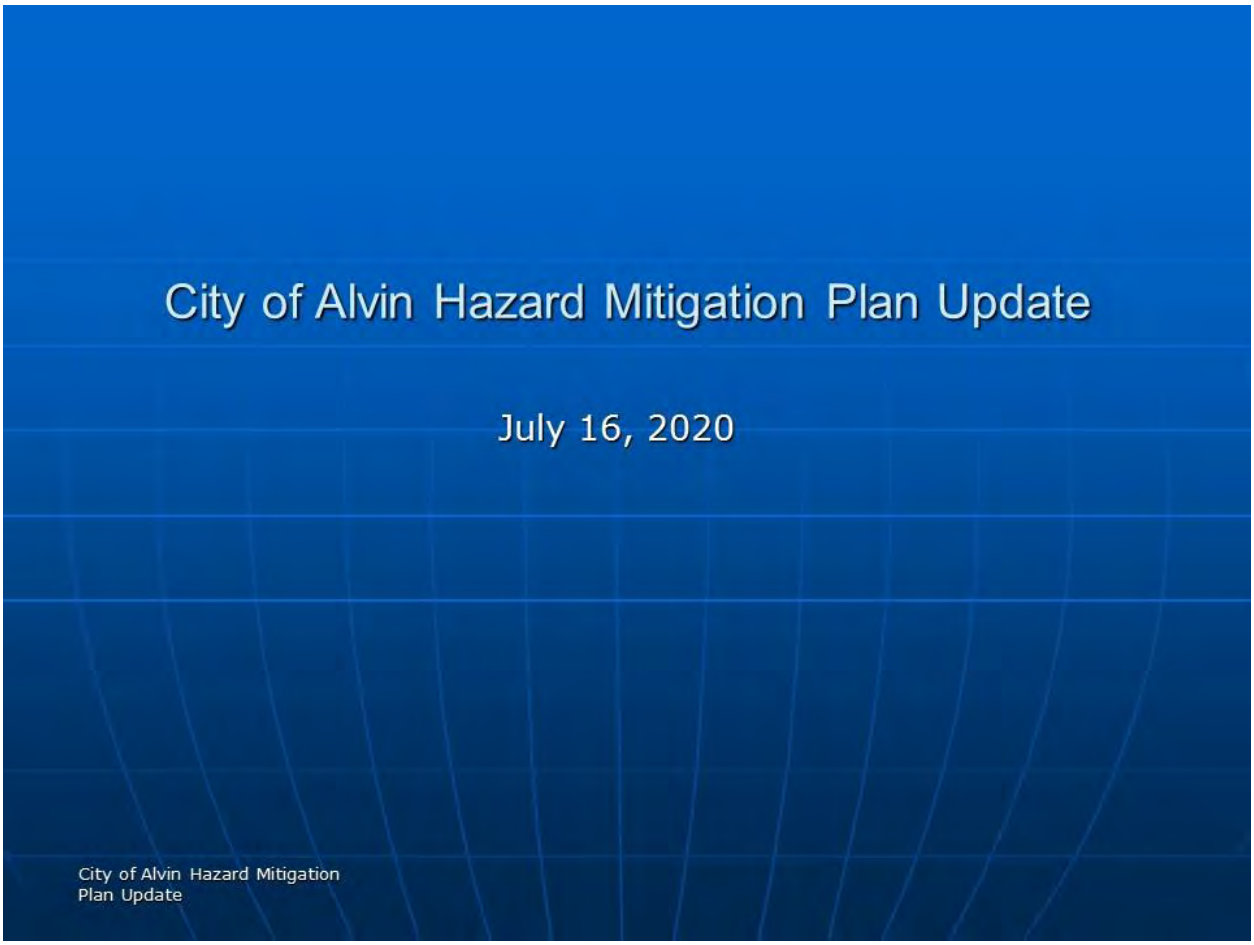
Michelle H. Segovia, P.E.
City Engineer
City of Alvin

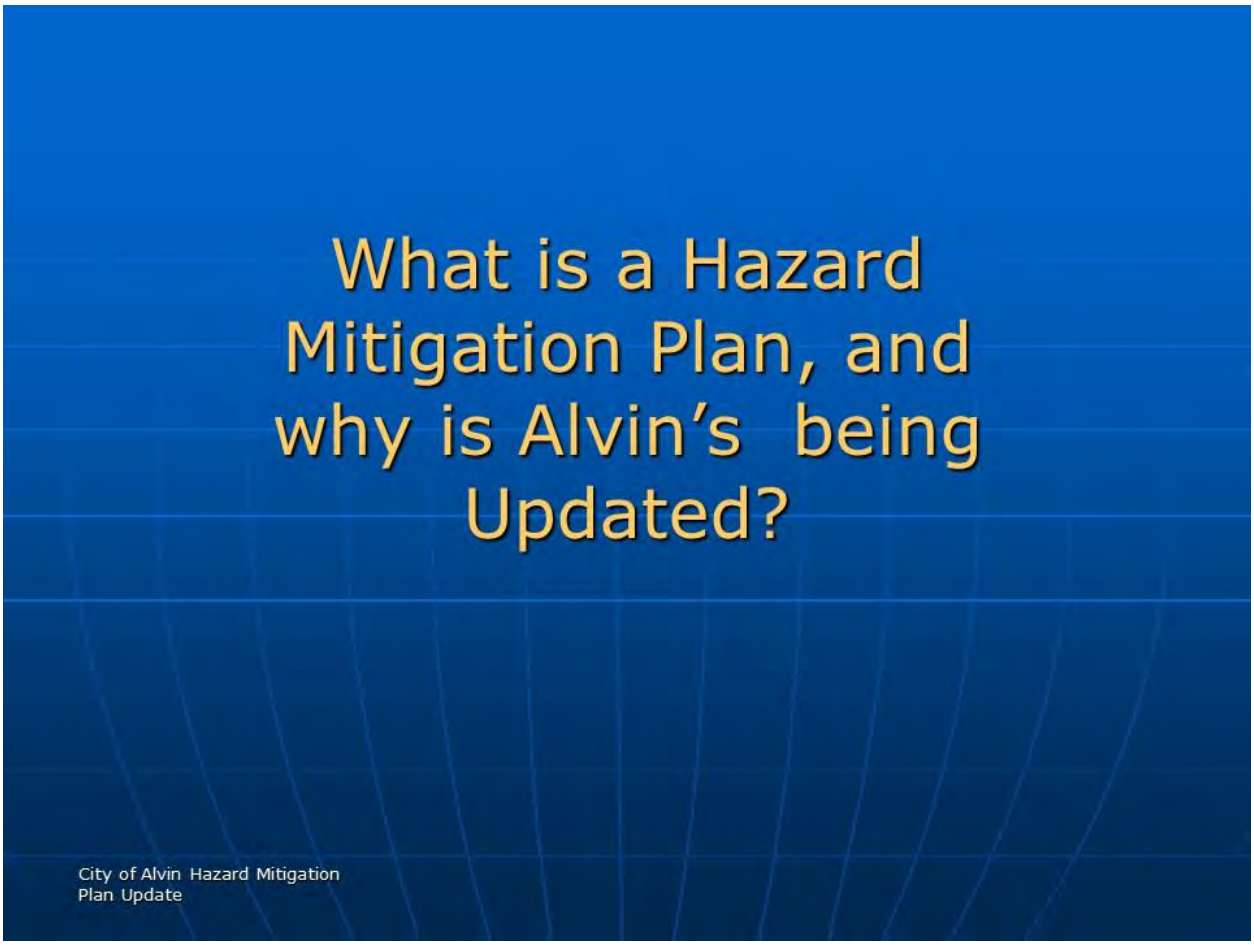
APPENDIX C

Presentation from First Public Meeting

Council Agenda

And Announcement


City of Alvin Hazard Mitigation Plan Update
July 16, 2020
City of Alvin Hazard Mitigation
Plan Update


What is a Hazard Mitigation Plan, and why is Alvin's being Updated?
City of Alvin 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
- City 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

City of Alvin 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

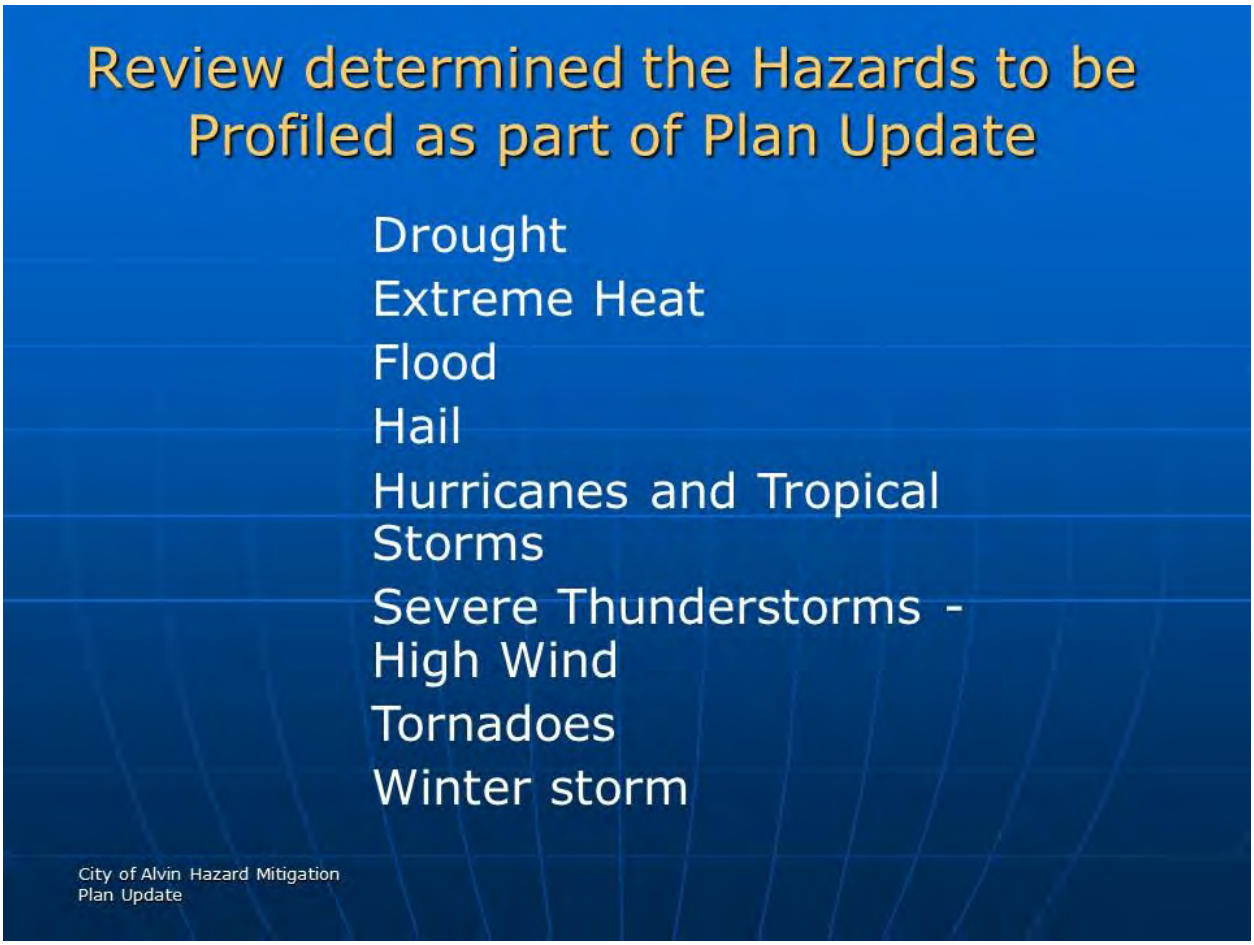
City of Alvin Hazard Mitigation Plan Update

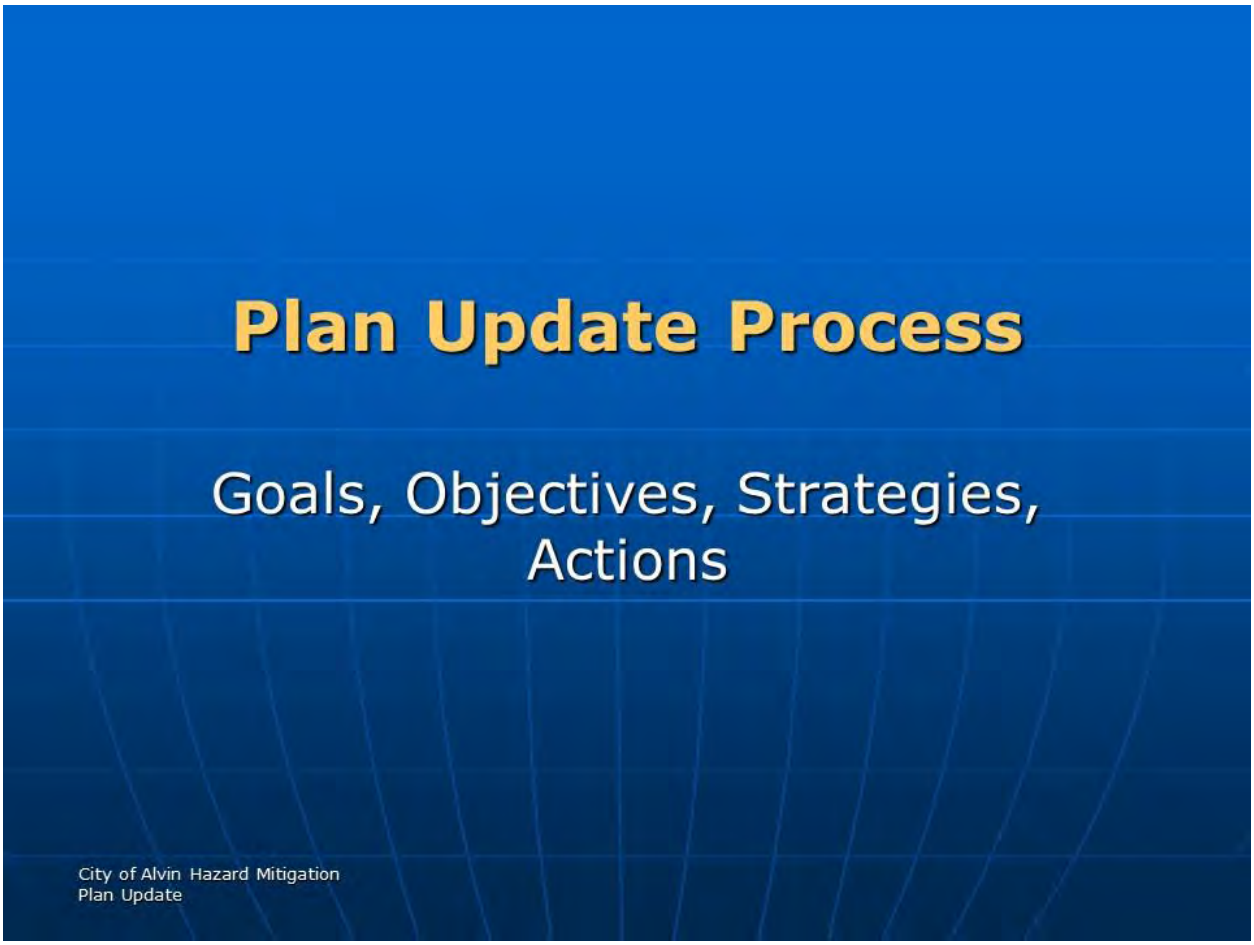
Plan Update Process

MPC Reviewed Hazards to determine significance to City

Hazard	Location	Maximum Probable Extent (Magnitude/Strength)	Probability of Future Event	Overall Significance Rating	Comments
Dam Failure	None in City	Weak	Unlikely	LOW - See Comments	Closest dam is at least 60 miles away. Inundation map from that dam shows no inundation in, near or around City - Will omit hazard
Drought	City-wide	Severe	Likely	LOW	Will include in plan update but lower priority actions.
Extreme Heat	City-wide	Moderate/Severe	Likely	MEDIUM/HIGH	Will include in plan update with higher priority actions.
Flood	City-wide	Moderate - rare event floods Severe - Base/TS event floods	Occasional	MEDIUM/HIGH	Will include in plan update with higher priority actions.
Hail	City-wide	Weak	Likely	LOW	Will include in plan update but lower priority actions.
Hurricane/ Tropical Storm	City-wide	Severe	Likely	HIGH	Will include in plan update with higher priority actions.
Lightning	City-wide	Weak/Moderate	Likely	LOW - See Comments	While hazard occurs in City, the City has provided all necessary mitigation measures to protect infrastructure and provide awareness. Will omit as no additional actions will be needed.
Severe Wind	City-wide	Moderate	Multi-Event	LOW	Will include in plan update but lower priority actions.
Severe Winter Weather	City-wide	Weak	Likely	LOW	Will include in plan update but lower priority actions.
Tornado	City-wide	Moderate/Severe	Occasional	LOW	Will include in plan update but lower priority actions.
Wildfire	No WUI	Weak	Unlikely	LOW - See Comments	GIS map shows no Wildfire Urban Interface in City. Fire Department reports indicate in past five years grass fires that caused no damage and were extinguished quickly. Will omit hazard.

City of Alvin Hazard Mitigation Plan Update


Review determined the Hazards to be Profiled as part of Plan Update
Drought
Extreme Heat
Flood
Hail
Hurricanes and Tropical Storms
Severe Thunderstorms - High Wind
Tornadoes
Winter storm
City of Alvin Hazard Mitigation Plan Update


Plan Update Process
Goals, Objectives, Strategies, Actions
City of Alvin Hazard Mitigation Plan Update

Plan Update Process – Further Streamlined Goal

The goal of this plan is to support the City'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 City will work to:

- Minimize and prevent damage to public and private buildings and infrastructure
- Reduce risk from flood through flood reduction projects, land use and floodplain policies and increased participation in NFIP and CRS by the community
- Reduce economic losses
- Increase cooperation and coordination among private entities, local agencies, State agencies and Federal agencies
- Increase education, outreach, and awareness
- Protect natural resources

City of Alvin 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

City of Alvin Hazard Mitigation Plan Update

Mitigation Strategy and Actions

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

City of Alvin Hazard Mitigation Plan Update

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

City of Alvin Hazard Mitigation Plan Update

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 (September). 30 Days to review
- Incorporate Stakeholder/Public Comments and submit to TDEM/FEMA for review
- Incorporate TDEM/FEMA comment for APA – Approved Pending Adoption
- Adopt the plan update

City of Alvin Hazard Mitigation 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.
- Four 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

City of Alvin Hazard Mitigation Plan Update

APPENDIX C (continued)

News Stories @ the City of Alvin

Return to Newsroom

Print

Posted: 07/13/2020 04:21 PM

City Council Meeting July 16, 2020 at 7:00 p.m.

City Council will meet in regular session on Thursday July 16, 2020 at 7:00 p.m. See agenda for details of the meeting.

File Attachement: Council_Agenda_071620.pdf

216 West Sealy • Alvin, Texas 77511 • 281-388-4200

City of Alvin, Texas

Paul Horn, Mayor

Joel Castro, Mayor Pro-tem, At Large Pos. 2
Brad Richards, At Large Pos. 1
Martin Vela, District A
Adam Arendell, District B

Keith Thompson, District C
Glenn Starkey, District D
Gabe Adame, District E

ALVIN CITY COUNCIL AGENDA
THURSDAY, JULY 16, 2020
7:00 P.M.
(Council Chambers)

Alvin City Hall, 216 West Sealy, Alvin, Texas 77511

Persons with disabilities who plan to attend this meeting that will require special services please contact the City Secretary's Office at 281-388-4255 or droberts@cityofalvin.com 48 hours prior to the meeting time. City Hall is wheel chair accessible and a sloped curb entry is available at the front east entrance to City Hall.

NOTICE is hereby given of a Regular Meeting and Executive Session of the City Council of the City of Alvin, Texas, to be held on **THURSDAY, JULY 16, 2020**, at 7:00 p.m. in the Council Chambers at: City Hall, 216 W. Sealy, Alvin, Texas.

BECAUSE OF COVID-19, SOCIAL DISTANCING GUIDELINES WILL BE FOLLOWED.
AUDIENCE SEATING CAPACITY WILL BE LIMITED.
THIS MEETING CAN BE VIEWED AT WWW.ALVIN-TX.GOV OR COMCAST CHANNEL 16

REGULAR MEETING AGENDA

1. **CALL TO ORDER**

2. **INVOCATION AND PLEDGE OF ALLEGIANCE**

3. **PRESENTATIONS**

   A. Presentation of the City of Alvin Municipal Court Fines and Delinquent Tax Collections Report by Mike Darlow of Perdue Brandon Fielder Collins & Mott, LLP.

   B. Hazard Mitigation Plan Update – City Engineer.

4. **PUBLIC COMMENT**

5. **CONSENT AGENDA: CONSIDERATION AND POSSIBLE ACTION:** An item(s) may be removed from the Consent Agenda for full discussion by the request of a member of Council. Item(s) removed will automatically become the first item up for discussion under Other Business.

   A. Consider approval of the June 18, 2020 City Council Workshop meeting minutes.

   B. Consider approval of the June 18, 2020 City Council Regular meeting minutes.

   C. Consider approval of the June 29, 2020 City Council Special meeting minutes.

   D. Consider a final plat of Caldwell Ranch Section 1 (located along the east side of FM 521 and north of Juliff-Manvel Road), being a subdivision of 20.573 acres of land situated in the William Hall League, abstract 31, Fort Bend County, Texas, also being a partial replat of lot 5 of the T.W. & J. W. B. House Subdivision, as recorded in volume 7, page 301 of the Fort Bend County deed records.

APPENDIX D

Stakeholder Letter to Review Plan

www.alvin-tx.gov

CITY OF ALVIN **Engineering Department**
1100 West Highway 6 • Alvin, Texas 77511 • (281) 388-4351 • FAX (281) 331-7516

June 23, 2020

Morad Kabiri
City Manager
City of Friendswood
910 South Friendswood Drive
Friendswood, TX 77546

Re: The City of Alvin, Texas, Local Hazard Mitigation Plan Update

Dear Mr. Kabiri:

As you may be aware, the City of Alvin, Texas is currently in the process of updating its FEMA Local 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 City as one that could be impacted by the mitigation actions and strategy and therefore, the City would like to invite you to be one of its stakeholders. If you accept, the City will send via a link, a draft to 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).

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

Sincerely,

Michelle H. Segovia

Michelle H. Segovia, P.E.
City Engineer
City of Alvin

APPENDIX E

PUBLIC NOTICE

281-686-0695

E-Employment Available

E-5 Skills/Trades

NEED EXPERIENCED
workers for remodeling. Need to have transportation/hand tools. Call Jesse, 281-677-7481

E-15 General Help

Greenhouse Labor Needed
Must Be Able To Work 5 days A Week Sometimes 7
Apply in Person at
Smith Nursery
1119 C.R. 192
Liverpool, TX 77577
281-393-1986

HELPER NEEDED
for remodeling work. No experience needed. Can pick up to and from work. Call John
281-509-4255

HOUSEKEEPING PERSONNEL
WANTED AT
THE KENTON APTS
Apply in person at
2441 S. Bypass 35,
Alvin or Call
281-388-1400

G-Merchandise for Sale

G-5 Misc. For Sale

HAND SANITIZER
Wholesale Prices. Gel and Liquid. Various sizes. Email: patrick@psgtrading.com

The Alvin Sun Accepts the following credit cards:
Discover • Visa
Master Card
American Express

Classifieds
281-331-4421

MERIDIANA PHASE THREE – MERIDIANA PKWY

A non mandatory Pre Bid Conference will be held on Tuesday, September 1, 2020 at 2:30 p.m. via GoToMeeting Conference Call. GoToMeeting information will be provided through CivCast email blast 24 hours prior to the non-mandatory Pre Bid Conference and posted on the door at the office of the Engineer.

The combined areas of the streetscape scope consists of sidewalk, planting space and irrigation infrastructure zoning.

The above described construction will be performed in accordance with plans and specifications and any addenda thereto which may be issued prior to the opening of bids. Plans, specifications and bid documents may be viewed and downloaded free of charge or the option to purchase hard copies on the CivCastUSA Website (www.CivCastUSA.com). Documents are also available for review at the office of the Engineer or Houston area plan rooms.

Each Bid must be accompanied by a Certified or Cashier's Check, from a responsible bank in the State of Texas, or a Bid Bond, issued by a surety legally authorized to do business in the State of Texas equal to five percent (5%) of the total bid amount. Make the Cashier's Check, Certified Check or Bid Bond payable to the Owner.

The Owner reserves the right to reject any or all bids or to accept any bid deemed advantageous to it and waive informalities in bidding. All bids received after the closing time above designated will be returned unopened.

#10294

City of Alvin
Public Notice
Hazard Mitigation Plan

The City of Alvin has achieved and maintains the State of Texas' advanced level of emergency planning preparedness through the development and maintenance of several contingency and hazard mitigation plans that help the City mitigate risk from, and consequences of, natural and man-made disasters. One of these plans is the Alvin Hazard Mitigation Plan. City staff are currently updating the City's 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 Alvin has not changed significantly since the current plan was prepared in 2015, the City has grown in both the size of its population and business community. Consequently, the number of citizens and business interests exposed to natural hazards has increased and this reality is reflected in the most recent update to the City of Alvin Hazard Mitigation Plan. In addition, the status of planned hazard mitigation efforts has been updated and beneficial future mitigation actions that are currently anticipated are also described.

The City anticipates making the draft hazard mitigation plan update available to the public for review and comment on September 4, 2020. This will occur in conjunction with a presentation to the City Council, which describes the draft plan update. The Council presentation will also coincide with the start of a 30-day public comment period during which Alvin residents and business interests can review the draft plan update and provide comments to

Sealed bids may be [illegible] Paper copy in duplicate. Bids will be received by Brazoria County Municipal Utility District No. 55 at the office of the Engineer for the District EHRA, 10011 Meadowglen Lane, Houston, Texas 77042, until 3:00 p.m., Thursday, September 17, 2020, at which time all bids will be publicly opened and read for the construction of the project via Zoom Conference Call.

BRAZORIA COUNTY MUNICIPAL UTILITY DISTRICT NO. 55
WATER DISTRIBUTION, WASTEWATER COLLECTION, STORM WATER FACILITIES AND PAVING TO SERVE MERIDIANA, SECTION EIGHTY ONE - B
Project No. 081-011-81 DST (J)/ROAD (L)

A non-mandatory Pre-Bid Conference will be held on Thursday, September 10, 2020 at 3:00 p.m. via Zoom Conference Call. Zoom information will be provided through CivCast email blast 24 hours prior to the non-mandatory Pre Bid Conference.

Project scope shall include the installation of approximately 982 LF 6-8 Inch PVC Waterline, 1,099 LF 8 Inch PVC sanitary, 283 LF 24-36 Inch RCP Storm, 5,120 SY of 6 Inch concrete paving.

The above described construction will be performed in accordance with plans and specifications and any addenda thereto which may be issued prior to the opening of bids. Plans, specifications and bid documents may be viewed and downloaded free of charge or the option to purchase hard copies on the CivCastUSA Website (www.CivCastUSA.com). Documents are also available for review at the office of the Engineer or Houston area plan rooms.

$393,256 OR 7.36% INCRE
YEAR'S BUDGET'S
AMOUNT, $321,927 IS T
BE RAISED FROM NEW
DED TO THE TAX RO
/S/ TAMMY BELL, CITY

I-3 Legal Notices

Each Bid must be accompanied by a Certified or Cashier's Check, from a responsible bank in the State of Texas, or a Bid Bond, issued by a surety legally authorized to do business in the State of Texas equal to five percent (5%) of the total bid amount. Make the Cashier's Check, Certified Check or Bid Bond payable to the Owner.

The Owner reserves the right to reject any or all bids or to accept any bid deemed advantageous to it and waive informalities in bidding. All bids received after the closing time above designated will be returned unopened.

#10296
PUBLISHED
AUGUST 23, 2020

Small Taxing Unit Notice

The CITY OF LIVERPOOL will hold a meeting at 6:30pm on September 01, 2020 at the City Hall located on CR 171 in Liverpool Texas 77577 to consider adopting a proposed tax rate for tax year 2020. The proposed tax rate is 0.164649 per $100 of value.

NOTICE
TO OUR READERS
Garage Sale ads are payment in advance. We accept Visa or MasterCard.

NOTICE
TO OUR READERS
Child care ads are payment in advance. We accept Visa or MasterCard.

LASSIFIED

Special Services

B-10 Apts. Unfurnished

OAK PARK VILLAGE
condominiums
Call For Availability 281-508-3901
201 Oak Park Drive • Alvin, TX 77511
www.opvcondos.com

MORGAN OAKS APARTMENTS
Call For Availability 281-388-0090
877 E. House St. • Alvin | MorganOakstx.com

I-Public Notices

I-3 Legal Notices

#10290
PUBLISHED
AUGUST 16 AND 23, 2020

INVITATION TO BID

Sealed bids may be submitted either (i) electronically using the CivCast USA ("Civ Cast") website (www.civcastusa.com), or (ii) Paper copy in duplicate. Bids will be received by Brazoria County Municipal Utility District No. 56 at the office of the Engineer for the District EHRA, 10011 Meadowglen Lane, Houston, Texas 77042, and electronic bids delivered via the CivCast website, untjl **2:30 p.m. Tuesday, September 15, 2020,** at which time all bids will be publicly opened and read for the construction of the project:

BRAZORIA COUNTY MUNICIPAL UTILITY DISTRICT NO. 56 MERIDIANA PHASE THREE – MERIDIANA PKWY
PH4 & PURSLEY BLVD PH1
Project No. 15-162-18

#10293
PUBLISHED
AUGUST 23 AND 30, 2020

NOTICE OF ONLINE PUBLIC AUCTION

Pursuant to Chapter 59 of the Texas Property Code, Fairway Mini Storage, 2601 Fairway Drive, Alvin, TX 77511 will hold a public auction of property being sold to satisfy a landlord's lien. Sale will begin at 12 Noon, September 6, 2020 through September 13, 2020 at 12 Noon at **storagetreasures.com**. Property to be sold to the highest bidder. Clean up deposit of $100 will be required. Seller reserves the right to withdraw any property from the sale, or not accept any bidder. Property being sold include the contents of the following units:

Dougherty, Kayla #25
Gomez, Vanessa #217
Mager, Milton #40
Nelon, Trevor #191
Olguin, Kristy #243
Pittman, Ashley #105
Rehwald, Heather#235
Reighard, Kristy #261
Rodriguez, Gina #31

#10294
PO#2020001733
PUBLISHED
AUGUST 23 AND 30, 2020

I-3 Legal Notices

the City before the update is finalized. The public is welcome to observe the presentation to the City Council on Thursday September 3, 2020 at 7:00 pm in the Council chambers located at 216 West Sealy, Alvin Texas 77511 or can view it on KACC TV. Thereafter the draft plan update can be found online at the City's website located at www.alvin-tx.gov. Public comments can be submitted to the City's Consultant JSWA and Associates at the following E-Mail address: kthatcher@rstarmail.com.

Once the comment period is closed, City staff will review all public comments and take them under consideration as the document is finalized. Once finalized, the draft plan update will then be submitted to TDEM and FEMA for review and approval. When notification of approval is received from FEMA, the draft plan update will be presented to the City Council for formal adoption, after which it will remain valid for five years. Questions regarding this important preparedness planning initiative can be directed to Michelle Segovia, City Engineer at msegovia@cityofalvin.com.

/s/ Dixie Roberts,
City Secretary

#10295
PUBLISHED
AUGUST 23 AND 30, 2020

INVITATION TO BID

Sealed bids may be submitted either (i) electronically using the CivCast USA ("Civ Cast") website (www.

I-3 Legal Notices

NOTICE OF BUDGET HEARING
CITY OF IOWA COLONY

The City Council of the City of Iowa Colony, Texas, will hold a p.m. on September 8, 2020, on the budget for the fiscal year begin and ending September 30, 2021. Due to the COVID-19 emergency, ticipate in the Council Chambers, Iowa Colony City Hall, 12003 Iowa Colony, Texas, or by internet video conference at https://global.gotomeeting.com/join/687471773; or by toll free 899-4679, with access code 687-471-773.New to GoToMeeting? ready when your first meeting starts: https://global.gotomeeting.c

THIS BUDGET WILL RAISE MO PROPERTY TAXES THAN LA BUDGET BY $1,063,117 OR 80.5 THAT AMOUNT $1,899,271 IS T UE TO BE RAISED FROM N ERTY ADDED TO THE TAX YEAR.

Kayleen Rosser
City Secretary

I-3 Legal Notices

NOTICE OF
TELECONFERENCE PUBLIC H
City of Manvel
September 8, 2020
AT 7:00 P.M.

NOTICE IS HEREBY GIVEN THAT A TELECONFE WILL BE HELD BEFORE THE MANVEL CITY C TUESDAY, SEPTEMBER 8, 2020.

The public hearing will be accessible by telephone. by calling; 210-469-0207 or toll free 877-257-2190 and 909#

THE PUBLIC HEARING IS FOR THE PURPOSE OF H AGAINST THE FOLLOWING:

THE PROPOSED ANNUAL THE FISCAL YEAR OF O TO SEPTEMBER 30, 2021. WILL RAISE MORE TOT TAXES THAN LAST YEAR $393,256 OR 7.36% INCREA YEAR'S BUDGET, AN AMOUNT, $321,927 IS TA

COUNCIL AGENDA

City of Alvin, Texas

Paul Horn, Mayor

Joel Castro, Mayor Pro-tem, At Large Pos. 2
Brad Richards, At Large Pos. 1
Martin Vela, District A
Adam Arendell, District B

Keith Thompson, District C
Glenn Starkey, District D
Gabe Adame, District E

ALVIN CITY COUNCIL AGENDA
THURSDAY, SEPTEMBER 3, 2020
7:00 P.M.
(Council Chambers)

Alvin City Hall, 216 West Sealy, Alvin, Texas 77511

Persons with disabilities who plan to attend this meeting that will require special services please contact the City Secretary's Office at 281-388-4255 or droberts@cityofalvin.com 48 hours prior to the meeting time. City Hall is wheel chair accessible and a sloped curb entry is available at the east, west, and south entrances to City Hall

NOTICE is hereby given of a Regular Meeting of the City Council of the City of Alvin, Texas, to be held on **THURSDAY, SEPTEMBER 3, 2020**, at 7:00 p.m. in the Council Chambers at: City Hall, 216 W. Sealy, Alvin, Texas.

REGULAR MEETING AGENDA

1. **CALL TO ORDER**

2. **INVOCATION AND PLEDGE OF ALLEGIANCE**

3. **PRESENTATION**

   A. Alvin Draft Hazard Mitigation Plan

4. **PUBLIC COMMENT**

5. **CONSENT AGENDA: CONSIDERATION AND POSSIBLE ACTION:** An item(s) may be removed from the Consent Agenda for full discussion by the request of a member of Council. Item(s) removed will automatically become the first item up for discussion under Other Business.

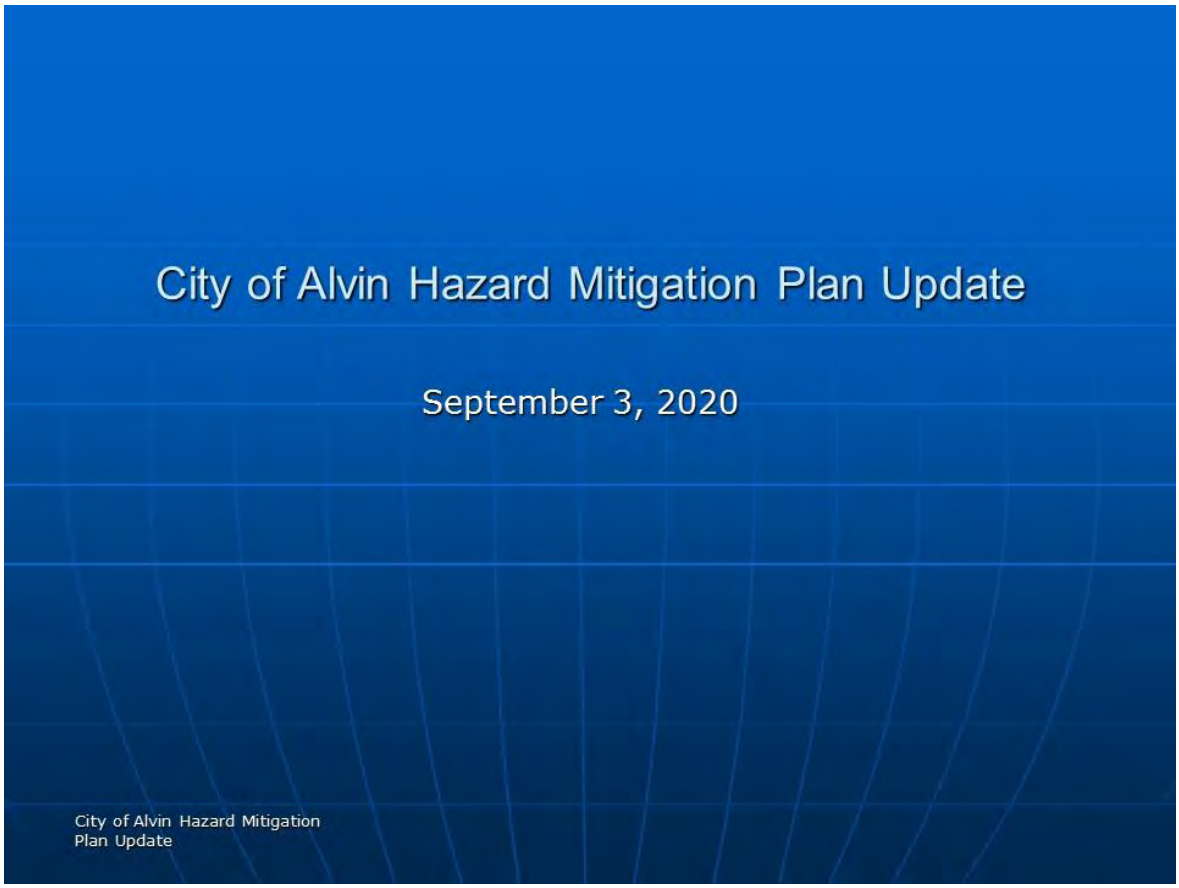
   A. Consider approval of the August 20, 2020 City Council Regular meeting minutes.

   B. Consider a final plat of Caldwell Ranch Section 3A (located along the east side of FM 521 and north of Juliff-Manvel Road), being a subdivision of 6.420 acres of land situated in the William Hall League, abstract 31, Fort Bend County, Texas; also being a partial replat of lots 5 and 6 of the T.W. & J. W. B. House Subdivision, as recorded in volume 7, page 301 of the Fort Bend County deed records.

   C. Consider a final plat of Caldwell Ranch Section 3B, (located along the east side of FM 521 and north of Juliff-Manvel Road), being a subdivision of 34.171 acres of land situated in the William Hall League, Abstract 31, Fort Bend County, Texas; also being a partial replat of Lots 5, 6 & 7 of the T.W. & J.W.B. House Subdivision, as recorded in Volume 7, Page 301 of the Fort Bend County deed records.

   D. Consider a final plat of Waller Crossing Drive Street Dedication (located along the east side of FM 521 and north of Juliff-Manvel Road), being a subdivision of 2.865 acres of land situated in the William Hall League, abstract 31, Fort Bend County, Texas; also being a

PRESENTATION FOR SECOND PUBLIC MEETING



Status of Plan Update

- 8-3-20 – 8-31-20: Stakeholders reviewed plan and provided comments
- 8-31-20: Stakeholder comments incorporated
- 9-3-20 Draft plan presented at Council meeting. Public is invited to comment. Comments due back by 10-5-20
- 9-4-20 Plan can be found on City's website
  - If a member of the public needs a printed copy, please contact the Engineering Department
  - Comments should be sent directly to City's Consultant JSWA on or before 10-5-20:

    Email: kthatcher@rstarmail.com

    Fax: 1-866-635-6582

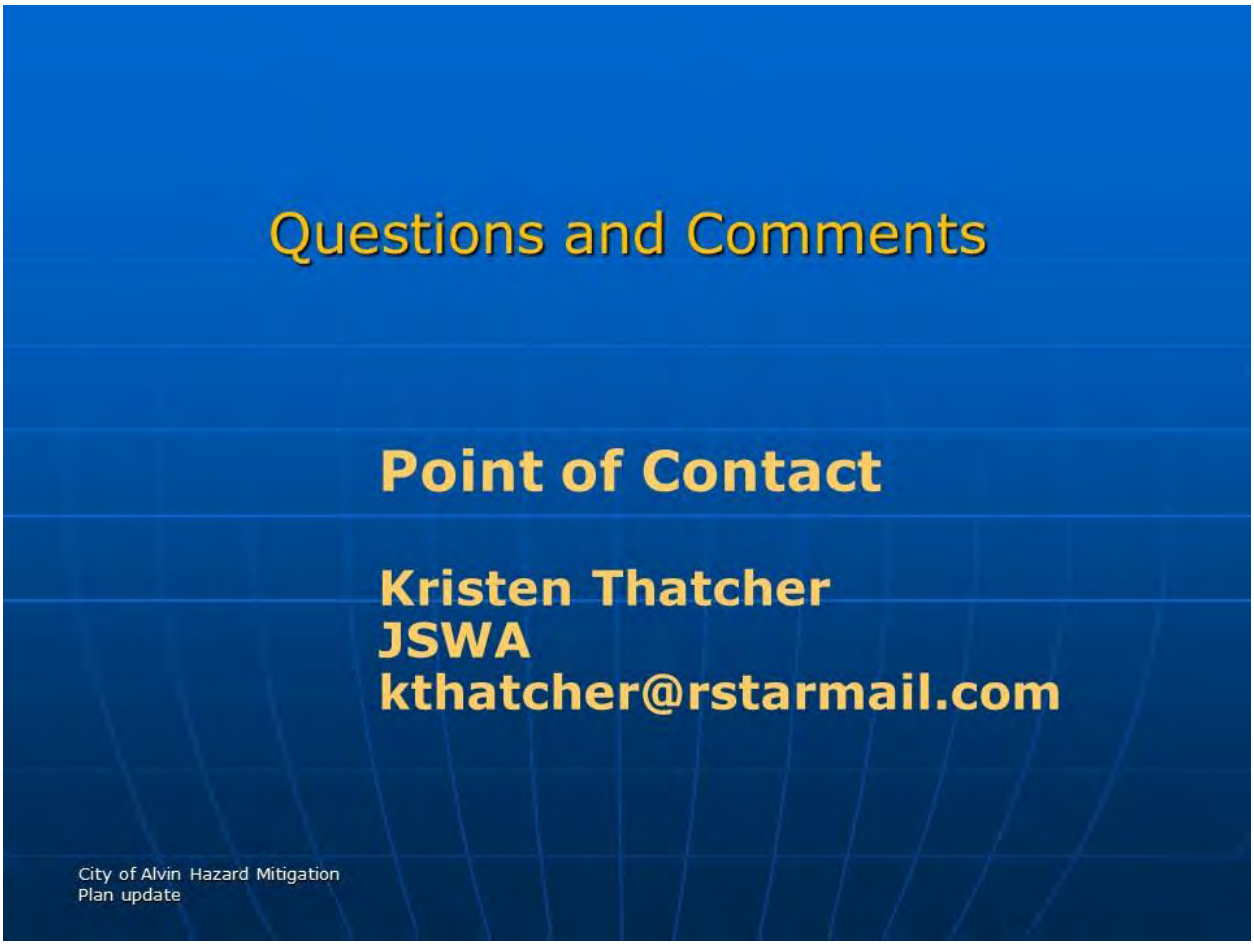
    Mail: P.O. Box 4356, Leesburg, VA 20177

City of Alvin
Hazard Mitigation
Plan Update

Next Steps After Public Comments

- Incorporate comments and changes into draft plan and submit to the Texas Division of Emergency Management – Submit by 10-16-20
- Incorporate TDEM Comments
- Re-submit to TDEM for FEMA review
- Incorporate FEMA comments
- FEMA approved pending adoption (APA)
- Council Adopts the plan update

City of Alvin Hazard Mitigation Plan Update


Questions and Comments
Point of Contact
Kristen Thatcher
JSWA
kthatcher@rstarmail.com
City of Alvin Hazard Mitigation
Plan update

APPENDIX F

Public Notice for Public Review of Plan

August 23rd Publication of the Public Notice

City of Alvin
Public Notice
Hazard Mitigation Plan

The City of Alvin has achieved and maintains the State of Texas' advanced level of emergency planning preparedness through the development and maintenance of several contingency and hazard mitigation plans that help the City mitigate risk from, and consequences of, natural and man-made disasters. One of these plans is the Alvin Hazard Mitigation Plan. City staff are currently updating the City's 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 Alvin has not changed significantly since the current plan was prepared in 2015, the City has grown in both the size of its population and business community. Consequently, the number of citizens and business interests exposed to natural hazards has increased and this reality is reflected in the most recent update to the City of Alvin Hazard Mitigation Plan. In addition, the status of planned hazard mitigation efforts has been updated and beneficial future mitigation actions that are currently anticipated are also described.

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Sealed bids may be ... Paper copy in duplicate. Bids will be received by Brazoria County Municipal Utility District No. 55 at the office of the Engineer for the District **EHRA, 10011 Meadowglen Lane**, Houston, Texas 77042, until 3:00 p.m., Thursday, September 17, 2020, at which time all bids will be publicly opened and read for the construction of the project via Zoom Conference Call.

BRAZORIA COUNTY MUNICIPAL UTILITY DISTRICT NO. 55 WATER DISTRIBUTION, WASTEWATER COLLECTION STORM WATER FACILITIES AND PAVING TO SERVE MERIDIANA, SECTION EIGHTY ONE - B
Project No. 081-011-81 DST (J)/ROAD (L)

A **non-mandatory** Pre-Bid Conference will be held on Thursday, September 10, 2020 at 3:00 p.m. via Zoom Conference Call. Zoom information will be provided through CivCast email blast 24 hours prior to the non-mandatory Pre Bid Conference.

Project scope shall include the installation of approximately 982 LF 6-8 Inch PVC Waterline, 1,099 LF 8 Inch PVC sanitary, 283 LF 24-36 Inch RCP Storm, 5,120 SY of 6 Inch concrete paving.

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The combined areas of the streetscape scope consists of sidewalk planting space and irrigation infrastructure zoning.

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Classifieds
281-331-4421

$393,256 OR 7.36% INCRE...
AMOUNT, $321,927 IS T...
BE RAISED FROM NEW...
DED TO THE TAX ROL...
/S/ TAMMY BELL, CITY...

I-3 Legal Notices

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#10296
PUBLISHED
AUGUST 23, 2020

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NOTICE
TO OUR READERS
Garage Sale ads are payment in advance. We accept Visa or MasterCard.

NOTICE
TO OUR READERS
Child care ads are payment in advance. We accept Visa or MasterCard.

281-686-0695

E-5 Skills/Trades

NEED EXPERIENCED worker for remodeling. Need to have transportation/hand tools. Call Jesse, 281-677-7481.

E-15 General Help

Greenhouse Labor Needed
Must Be Able To Work 6 days A Week Sometimes 7
Apply In Person at
Smith Nursery
1119 C.R. 192
Liverpool, TX 77577
281-393-1986

HELPER NEEDED for remodeling work. No experience needed. Can pick up to and from work. Call John 281-509-4255

HOUSEKEEPING PERSONNEL WANTED AT THE KENTON APTS. Apply in person at 2441 S. Bypass 35, Alvin or Call 281-388-1400

G-Merchandise for Sale

G-5 Misc. For Sale

HAND SANITIZER Wholesale Prices. Gel and Liquid. Various sizes. Email: patrick@psgtrading.com

The Alvin Sun Accepts the following credit cards:
Discover • Visa
Master Card
American Express

August 23rd Publication of the Public Notice

LASSIFIED

Special Services

B-10 Apts. Unfurnished

OAK PARK VILLAGE
condominiums
Call For Availability 281-508-3901
201 Oak Park Drive • Alvin, TX 77511
www.opvcondos.com

MORGAN OAKS APARTMENTS
Call For Availability 281-388-0090
877 E. House St. • Alvin | MorganOakstx.com

I-Public Notices

I-3 Legal Notices

#10290
PUBLISHED
AUGUST 16 AND 23, 2020

INVITATION TO BID

Sealed bids may be submitted either (i) electronically using the CivCast USA ("Civ Cast") website (www.civcastusa.com), or (ii) Paper copy in duplicate. Bids will be received by Brazoria County Municipal Utility District No. 56 at the office of the Engineer for the District EHRA, 10011 Meadowglen Lane, Houston, Texas 77042, and electronic bids delivered via the CivCast website, untjl **2:30 p.m., Tuesday, September 15, 2020,** at which time all bids will be publicly opened and read for the construction of the project:

BRAZORIA COUNTY MUNICIPAL UTILITY DISTRICT NO. 56 MERIDIANA PHASE THREE – MERIDIANA PKWY
PH4 & PURSLEY BLVD PH1
Project No. 15-162-1

#10293
PUBLISHED
AUGUST 23 AND 30, 2020

NOTICE OF ONLINE PUBLIC AUCTION

Pursuant to Chapter 59 of the Texas Property Code, Fairway Mini Storage, 2601 Fairway Drive, Alvin, TX 77511 will hold a public auction of property being sold to satisfy a landlord's lien. Sale will begin at 12 Noon, September 6, 2020 through September 13, 2020 at 12 Noon at **storagetreasures.com**. Property to be sold to the highest bidder. Clean up deposit of $100 will be required. Seller reserves the right to withdraw any property from the sale or not accept any bidder. Property being sold include the contents of the following units:

Dougherty, Kayla #25
Gomez, Vanessa #217
Mager, Milton #40
Nelon, Trevor #191
Olguin, Kristy #243
Pittman, Ashley #105
Rehwald, Heather#235
Reighard, Kristy #261
Rodriguez, Gina #31

#10294
PO#2020001733
PUBLISHED
AUGUST 23 AND 30, 2020

I-3 Legal Notices

the City before the update is finalized. The public is welcome to observe the presentation to the City Council on Thursday September 3, 2020 at 7:00 pm in the Council chambers located at 216 West Sealy, Alvin Texas 77511 or can view it on KACC TV. Thereafter the draft plan update can be found online at the City's website located at www.alvin-tx.gov. Public comments can be submitted to the City's Consultant JSWA and Associates at the following E-Mail address: kthatcher@rstarmail.com.

Once the comment period is closed, City staff will review all public comments and take them under consideration as the document is finalized. Once finalized, the draft plan update will then be submitted to TDEM and FEMA for review and approval. When notification of approval is received from FEMA, the draft plan update will be presented to the City Council for formal adoption, after which it will remain valid for five years. Questions regarding this important preparedness planning initiative can be directed to Michelle Segovia, City Engineer at msegovia@cityofalvin.com.

/s/ Dixie Roberts,
City Secretary

#10295
PUBLISHED
AUGUST 23 AND 30, 2020

INVITATION TO BID

Sealed bids may be submitted either (i) electronically using the CivCast USA ("Civ Cast") website (www.

I-3 Legal Notices

NOTICE OF BUDGET HEARING
CITY OF IOWA COLONY

The City Council of the City of Iowa Colony, Texas, will hold a p.m. on September 8, 2020, on the budget for the fiscal year begin and ending September 30, 2021. Due to the COVID-19 emergency, ticipate in the Council Chambers, Iowa Colony City Hall, 12003 I Iowa Colony, Texas, or by internet video conference at https://global.gotomeeting.com/join/687471773; or by toll free t 899-4679, with access code 687-471-773.New to GoToMeeting? ready when your first meeting starts: https://global.gotomeeting.c

THIS BUDGET WILL RAISE MO PROPERTY TAXES THAN LA BUDGET BY $1,063,117 OR 80.5 THAT AMOUNT $1,899,271 IS T UE TO BE RAISED FROM N ERTY ADDED TO THE TAX YEAR.

Kayleen Rosser
City Secretary

I-3 Legal Notices

NOTICE OF
TELECONFERENCE PUBLIC H
City of Manvel
September 8, 2020
AT 7:00 P.M.

NOTICE IS HEREBY GIVEN THAT A TELECONFE WILL BE HELD BEFORE THE MANVEL CITY C TUESDAY, SEPTEMBER 8, 2020.

The public hearing will be accessible by telephone. by calling; 210-469-0207 or toll free 877-257-2190 and 909#

THE PUBLIC HEARING IS FOR THE PURPOSE OF H AGAINST THE FOLLOWING;

THE PROPOSED ANNUAL THE FISCAL YEAR OF O TO SEPTEMBER 30, 2021. WILL RAISE MORE TOT TAXES THAN LAST YEAR $393,256 OR 7.36% INCREA YEAR'S BUDGET, AN AMOUNT, $321,927 IS TA

August 30th Publication of the Public Notice

E-5 Skills/Trades

NEED EXPERIENCED worker for remodeling. Need to have transportation/hand tools. Call Jesse, 281-677-7481.

E-15 General Help

HOUSEKEEPING PERSONNEL WANTED AT THE KENTON APTS Apply in person at 2441 S. Bypass 35, Alvin or Call 281-388-1400

G-Merchandise for Sale

G-5 Misc. For Sale

HAND SANITIZER Wholesale Prices. Gel and Liquid. Various sizes. Email: patrick@psgtrading.com

I-Public Notices

I-3 Legal Notices

#10293
PUBLISHED
AUGUST 23 AND 30, 2020

NOTICE OF ONLINE PUBLIC AUCTION

Pursuant to Chapter 59 of the Texas Property Code, Fairway Mini Storage, 2601 Fairway Drive, Alvin, TX 77511 will hold a pub-

#10294
PO#2020001733
PUBLISHED
AUGUST 23 AND 30, 2020

City of Alvin
Public Notice
Hazard Mitigation Plan

The City of Alvin has achieved and maintains the State of Texas' advanced level of emergency planning preparedness through the development and maintenance of several contingency and hazard mitigation plans that help the City mitigate risk from, and consequences of, natural and man-made disasters. One of these plans is the Alvin Hazard Mitigation Plan. City staff are currently updating the City's 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 Alvin has not changed significantly since the current plan was prepared in 2015, the City has grown in both the size of its population and business community. Consequently, the number of citizens and business interests exposed to natural hazards has increased and this reality is reflected in the most recent update to the City of Alvin Hazard Mitigation Plan. In addition, the status of planned hazard mitigation efforts has been updated

ADOPTED ORDINANCE

ORDINANCE 20-W

AN ORDINANCE AMENDING CHAPTER 28, COMPREHENSIVE FEE ORDINANCE, OF THE CODE OF ORDINANCES, CITY OF ALVIN, TEXAS FOR THE PURPOSE OF SETTING CERTAIN SOLID WASTE COLLECTION AND DISPOSAL FEES FOR RESIDENTIAL, COMMERCIAL AND ROLL-OFF CONTAINERS; PROVIDING FOR A TEN PERCENT (10%) PENALTY FOR LATE PAYMENT; PROVIDING FOR AN EFFECTIVE DATE OF OCTOBER 2020 BILLING CYCLES; AND SETTING FORTH OTHER PROVISIONS RELATED THERETO. Ordinance 20-W in full can be viewed: www.alvintx.gov / public notices.

/s/ Dixie Roberts,
City Secretary

#10300
PUBLISHED
AUGUST 30, 2020 AND SEPTEMBER 6, 2020

INVITATION TO BID

Sealed bids may be submitted either (i) electronically using the CivCast USA ("Civ Cast") website (www.civcastusa.com), or (ii) Paper copy in duplicate. Bids will be

may be viewed
downloaded fre
charge or the opti
purchase hard c
on the CivCast
Website (www
CastUSA.com).
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office of the En
or Houston are
rooms.

Each Bid must
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Check, from a r
ible bank in th
of Texas, or
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the State of
equal to five
(5%) of the t
amount. Ma
Cashier's Chec
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Bond payable
Owner.

The Owner r
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or all bids or t
any bid deem
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waive inform
bidding. All
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unopened.

#10299
PUBLISH
AUGUST
SEPTEM
13, 2020

PUBLIC

Notice is
that Peles,
under and
the terms
sions of
NANCE
CITY OF

FOR LEASE OR SALE: Approx. 1900 sq. ft. building & Approx. 375 sq. ft. building on 3 lots. Call for Details. 281-808-2030

D-Services Available

D-5 Special Services

Joe's Hauling & Tractor Service
Crushed Concrete & Asphalt • Sand & Fill
• Washout • Pasture Mowing
281-489-7080

HALLMARK'S TREE SERVICE
Summer Special!
10% OFF
Tree Trimming, Tree Removal, Stump Grinding, Land Clearing, Deep Root Feeding.
*** INSURED ***
832-499-8636

R.B. DOZER & DUMP TRUCK
• Backhoe • Ponds
• Site Preps
• Driveways
Crushed Concrete
• Sand • Select Fill
832-731-4553

alazar Roofing & More
Local Company -
LL TYPES OF ROOFS
• Roof Cleaning
emodeling • Flooring
• Sheetrock Repair
• Decks • Fences
Pressure Washing
Reasonable Rates
Work Guaranteed
• Free Estimates
3-366-9278

of the Texas Property Code, Fairway Mini Storage, 2601 Fairway Drive, Alvin, TX 77511 will hold a public auction of property being sold to satisfy a landlord's lien. Sale will begin at 12 Noon September 6, 2020 through September 13, 2020 at 12 Noon at **storagetreasures.com**. Property to be sold to the highest bidder. Clean up deposit of $100 will be required. Seller reserves the right to withdraw any property from the sale or not accept any bidder. Property being sold include the contents of the following units:

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Pittman, Ashley #105
Rehwald, Heather#235
Reighard, Kristy #261
Rodriguez, Gina #31

#10297
PUBLISHED AUGUST 30, 2020

HEARING NOTICE
City of Manvel

NOTICE IS HEREBY GIVEN THAT THE MANVEL CITY COUNCIL WILL HOLD A TELECONFERENCE PUBLIC HEARING ON MONDAY, SEPTEMBER 21, 2020 AT 7:00 P.M. TO HEAR COMMENTS "FOR" OR "AGAINST" AN OIL AND GAS DRILLING WELL PERMIT APPLICATION FROM PELES, LLC. REQUESTING TO DRILL AND OPERATE THE H.O.F.A. 51H WELL, BEING AN OIL AND GAS

Alvin Hazard Mitigation Plan. In addition the status of planned hazard mitigation efforts has been updated and beneficial future mitigation actions that are currently anticipated are also described.

The City anticipates making the draft hazard mitigation plan update available to the public for review and comment on September 4, 2020. This will occur in conjunction with a presentation to the City Council which describes the draft plan update. The Council presentation will also coincide with the start of a 30-day public comment period during which Alvin residents and business interests can review the draft plan update and provide comments to the City before the update is finalized. The public is welcome to observe the presentation to the City Council on Thursday, September 3, 2020 at 7:00 pm in the Council chambers located at 216 West Sealy, Alvin, Texas 77511 or can view it on KACC TV. Thereafter the draft plan update can be found online at the City's website located at www.alvin-tx.gov. Public comments can be submitted to the City's Consultant JSWA and Associates at the following E-Mail address: kthatcher@rstarmail.com.

Once the comment period is closed, City staff will review all public comments and take them under consideration as the document is finalized. Once finalized, the draft plan update will then be

Cast") website (www.civcastusa.com), or (ii) Paper copy in duplicate. Bids will be received by Brazoria County Municipal Utility District No. 55 at the office of the Engineer for the District **EHRA, 10011 Meadowglen Lane**, Houston, Texas 77042, until 3:30 p.m., Thursday, September 24, 2020, at which time all bids will be publicly opened and read for the construction of the project via Zoom Conference Call.

BRAZORIA COUNTY MUNICIPAL UTILITY DISTRICT NO. 55 WATER DISTRIBUTION, WASTEWATER COLLECTION, STORM WATER FACILITIES AND PAVING TO SERVE MERIDIANA COMMERCIAL, SECTION SIX EIGHT Project No. 081-011-68-01 DST (J)/ROAD (L)

A **non-mandatory** Pre-Bid Conference will be held on Thursday, September 17, 2020 at 3:30 p.m via Zoom Conference Call. Zoom information will be provided through CivCast email blast 24 hours prior to the non-mandatory Pre Bid Conference.

Project scope shall include the installation of approximately 1,096 LF of 8" PVC waterline, 796 LF 8" PVC sanitary sewer, 1,625 LF 24"-42" RCP storm sewer, 4,337 SY of 6" concrete paving.

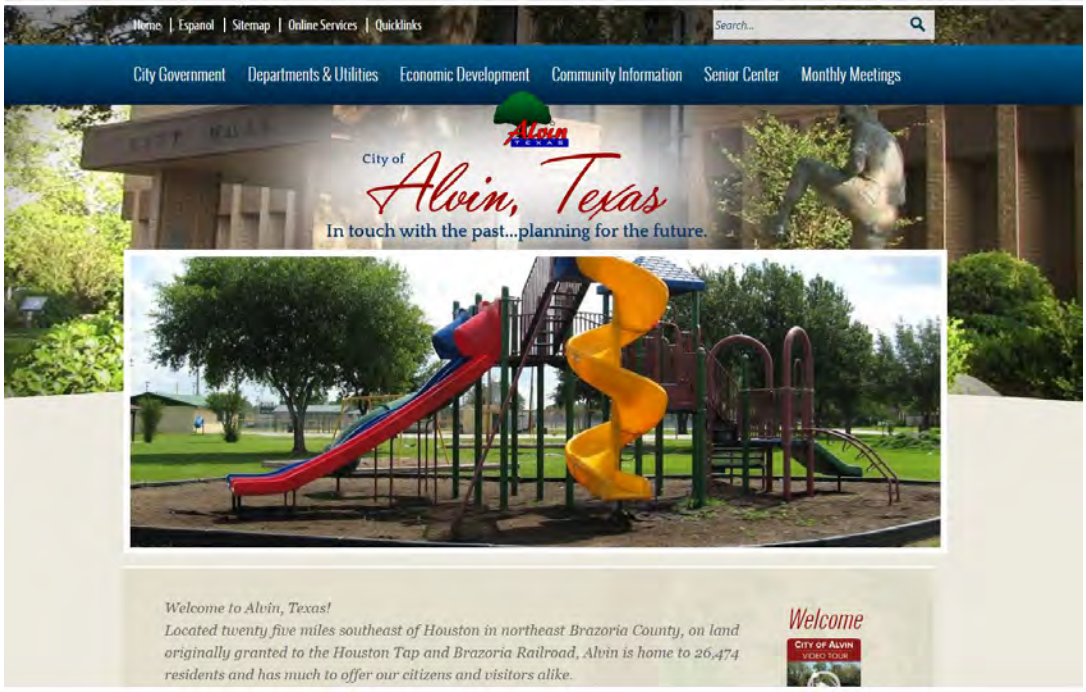
The above described construction will be performed in accordance with plans and the terms and provisions of AN ORDINANCE OF THE CITY OF MANVEL TEXAS, did on the 19th day of August 2020, file with the city secretary of the city an application to drill complete, and operate a well located on a 37.90 acre tract of land, more or less being Tract 9-9A, in the H. N. Little Survey Abstract No. 319 within the City o Manvel, Texas, a "Tract 3" in that cer tain Warranty Dee from Charles W Belcher to Denic Belcher, recorded i Document Numbe 2016053503 of the O ficial Public Recor of Brazoria Count Texas.

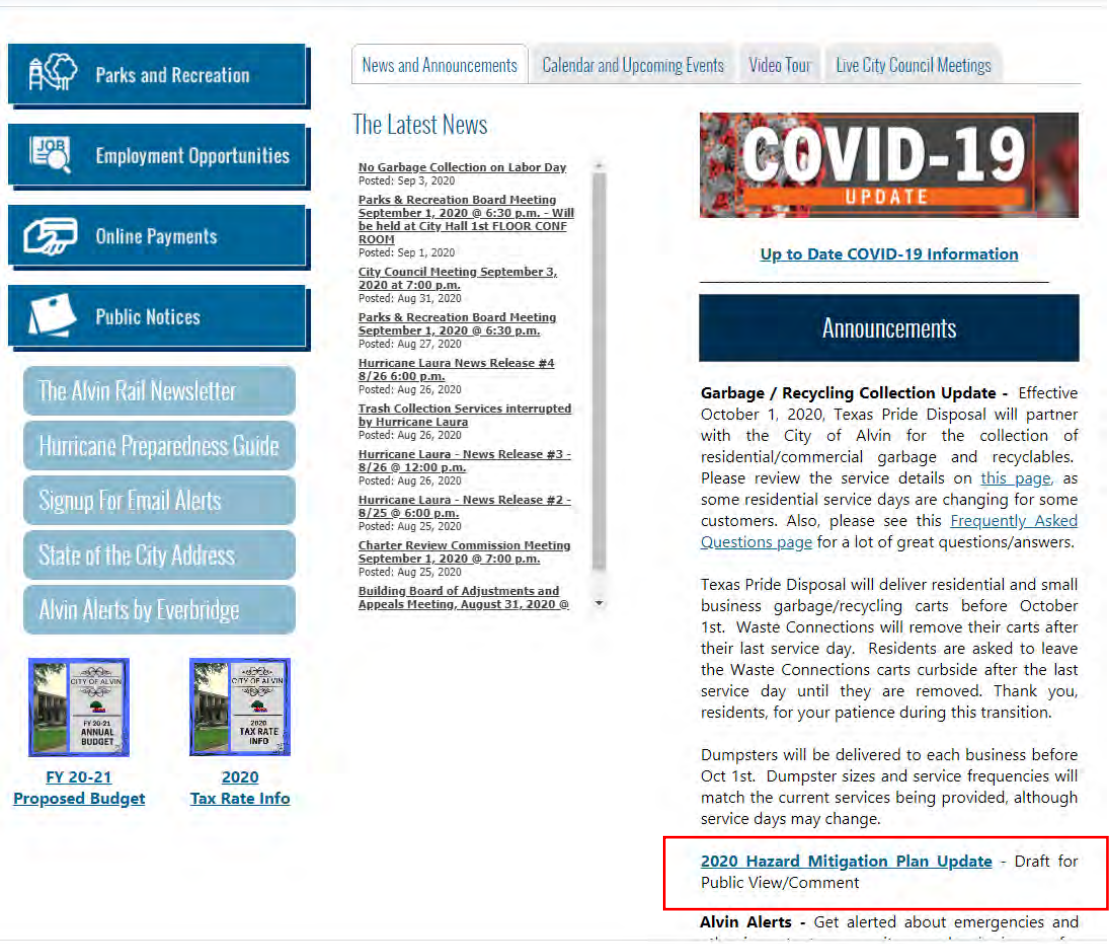
#10295
PUBLISHED AUGUST 23 AND 2020

INVITATION T BID

Sealed bids may submitted either electronically using CivCast USA ("Cast") website (w civcastusa.com), o Paper copy in du ate. Bids will b ceived by Braz County Munic Utility District N at the office of th gineer for the Di **EHRA, 10011 M owglen Lane**, ton, Texas 7704 til 3:00 p.m., Thu September 17, 20 which time all will be publicly o and read for th struction of the p via Zoom Conf Call.

Draft Plan on City's Website

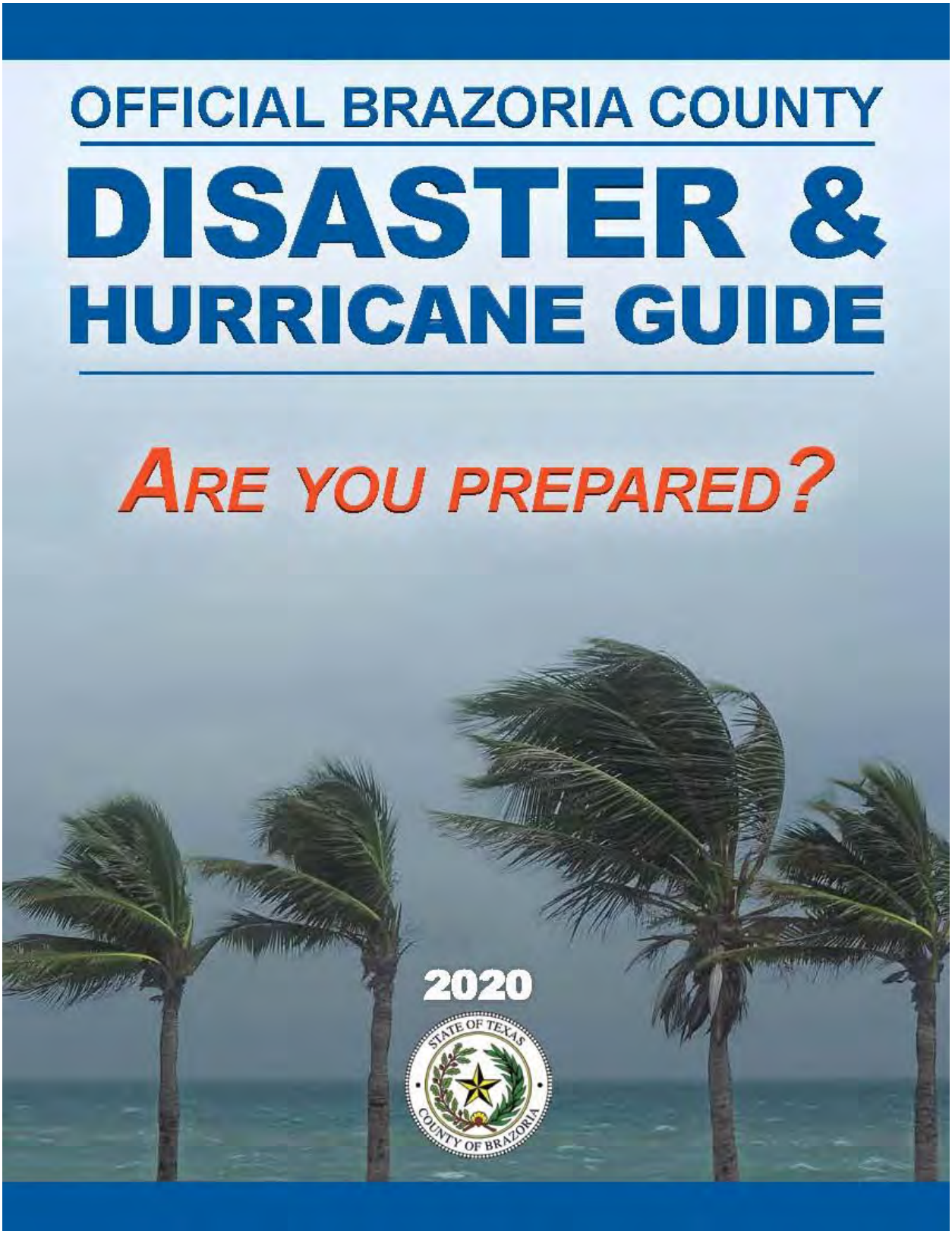




APPENDIX G

Brazoria County 2020

Hurricane Preparedness Guide


OFFICIAL BRAZORIA COUNTY
DISASTER &
HURRICANE GUIDE
ARE YOU PREPARED?
2020
STATE OF TEXAS
COUNTY OF BRAZORIA

Dear Citizens of Brazoria County,

Amidst all the challenges 2020 has given us with COVID-19, we must now prepare for the 2020 Hurricane Season. As a coastal county, preparing for hurricane season is nothing new. This year with the novel coronavirus pandemic, new challenges and plans need to be thought through. I encourage you to review your family's emergency plans and be prepared for change due to coronavirus. Updating your plans will help you better prepare for whatever the 2020 Hurricane Season brings.

Take time to read this guide, the information provided could save your life and the life of your loved ones. Preparedness is the key to protecting you, your family and property.

Remember, if you or a loved one will need transportation to safety during an emergency event, you need to register NOW, by dialing 2-1-1. Do not wait to register. Review the section in this guide for information on registering with S.T.E.A.R./2-1-1.

Be Prepared and Stay Safe Brazoria County!

L.M. "Matt" Sebesta, Jr.

Brazoria County Judge

BRAZORIA COUNTY

Official Communication and Information

tinyurl.com/BrazoriaCo

@BrazoriaCounty

@BrazoriaCounty

pio@brazoria-county.com

brazoriacountytx.gov

Sign-up for the **eNotification System**
tinyurl.com/bcnotification

24 Hour Emergency Event Hotline Numbers:
979-864-1064
979-388-1064
281-756-1064

Download "Ready Brazoria County" on the App Store or Google Play

2020 DISASTER & HURRICANE GUIDE

2 GETTING PREPARED

2 Prepare Your Home
2 Prepare Your Vehicle
3 Family Disaster Check List
4 Marine and Businesses Prep.
5 Prepare for a Flood

6 IF YOU NEED A RIDE OUT OF TOWN

6 STEAR Registry (2-1-1)
7 Evacuation HUBS in Brazoria County

8 IF YOU HAVE YOUR OWN TRANSPORTATION

8 Evacuation Plans
9 Evacuation Zones
10 Evacuating Pets
10 Evacuating Livestock
11 Emergency Shelters

12 ALL HAZARD INFORMATION

13 Severe Weather and Skywarn
14 Heat and Generator Safety
15 Shelter in Place
16 Ready Brazoria County App

17 VOLUNTEER OPPORTUNITIES

17 Volunteer Opportunities

18 RETURNING HOME

18 Returning Home

GETTING PREPARED

Prepare Your Home

- **Buy flood insurance.**
- There is a 30 day waiting period before newly purchased flood insurance goes into effect.
- Install commercial shutters or prepare 5/8 inch plywood panels for your windows.
- Reinforce garage doors so that they are able to withstand high winds. Garage doors are frequently the first feature in a home to fail.
- Trim all dead wood, weak, and overhanging branches from trees as they could damage your or your neighbor's property.

Before you leave

- Move outside items to safety, such as patio furniture, plants, and grills.
- Put valuable documents in waterproof containers and take them with you when you evacuate.
- Turn off electricity at the main circuit breaker or fuse box.
- Turn off gas at the appliances.
- Remove perishable items from your refrigerator and freezer.
- Make a final walk-through inspection before closing the door.
- Close all interior doors in your home.

Brazoria County eNotification System

Sign-up to receive emails on upcoming events, projects, road closures, emergency communications, etc. Stay informed! Sign up TODAY!

tinyurl.com/bcnotification

Prepare Your Vehicle

- Fill up with fuel before you leave town. It's smart to keep your tank at least half full during the entire hurricane season.
- Check your vehicle's fluid levels and ensure there is adequate coolant in the radiator.
- Check your tire pressure.
- Ensure you have a jack, a lug wrench, and know where they are in the vehicle.
- Carry enough water and non-perishable food for you and your passengers in case you become stranded.
- Have a working flashlight and extra batteries.
- If you are stranded, stay with your vehicle and use emergency flashers. Tie a white cloth on the antenna or door handle and raise the hood.

If you're traveling with children be sure to pack items to help keep them entertained

- Reading materials, puzzle, games, coloring books, and electronics with extra chargers and batteries.
- Fun road games like Highway BINGO and I Spy. Go Online to find lists and ideas.
- Low sugar snacks and sugar free drinks.
- A change of clothes.

GETTING PREPARED

Family Disaster Checklist

Essentials
- ❑ Cell phone and charger
- ❑ This guide
- ❑ Battery-operated radio
- ❑ Flashlight
- ❑ Extra Batteries
- ❑ Cash
- ❑ Map of the area

Baby Needs
- ❑ Formula, diapers, bottles, medication and powdered milk.

Medical Needs
- ❑ Insulin
- ❑ Prescription drugs in original containers
- ❑ Heart and high blood pressure needs
- ❑ Denture needs
- ❑ Extra eye glasses
- ❑ Contact lenses and supplies
  Doctor's phone numbers

Clothing & Bedding
- ❑ Plastic garbage bags, ties
- ❑ Sunglasses
- ❑ Rain gear
- ❑ Sturdy shoes or work boots
- ❑ Blankets or sleeping bags
- ❑ Complete change of clothing and footwear per person

Cooking Preparation
- ❑ Mess kits or paper cups, plates and plastic utensils
- ❑ Non-electric can opener, utility knife
- ❑ Barbecue for outdoor use only with charcoal and lighter, or sterno stove
- ❑ Pot or pan
- ❑ Manual can opener
- ❑ Barbecue utensils and cooking utensils

Entertainment
- ❑ Games & books

Safety
- ❑ First Aid Kit (one for your home and one for each car)
- ❑ Fire Extinguisher
- ❑ Whistle
- ❑ Compass

Food
- ❑ Minimum 7-day supply of nonperishable food that requires no refrigeration or preparation, and little or no water
- ❑ Dry cereal
- ❑ Peanut butter
- ❑ Canned fruits
- ❑ Canned vegetables
- ❑ Canned juice
- ❑ Ready-to-eat canned meats
- ❑ Ready-to-eat soups (not concentrated)
- ❑ Quick energy snacks
- ❑ Graham crackers

Important documents
- ❑ Important telephone numbers
- ❑ Record of bank account numbers
- ❑ Family records (birth, marriage, death certificates)
- ❑ Inventory of household valuables with digital pictures and video
- ❑ Copy of will, insurance policies
- ❑ Records of credit card account numbers and companies
- ❑ Copy of passport, social security cards, and immunization records
- ❑ Current Utility Bills

Pet Needs
- ❑ Food, leash, collar/ harness, carrier, non-tip food and water containers

Water
- ❑ 7 gallons per person, minimum, in a food-grade, plastic container
- ❑ Additional water for sanitation

Sanitation
- ❑ Disinfectant
- ❑ Household chlorine bleach
- ❑ Soap, liquid detergent
- ❑ Toilet paper, towelettes, paper towels
- ❑ Personal hygiene items
- ❑ Cloth towels (at least 3)
- ❑ Feminine supplies
- ❑ Plastic bucket with tight lid
- ❑ Plastic garbage bags, ties (for personal sanitation use)
- ❑ Hand Sanitizer

Supplies
- ❑ Insect Repellent
- ❑ Sunscreen
- ❑ Aluminum Foil
- ❑ Paper, Pencil
- ❑ Plastic sheeting and tarp
- ❑ Medicine dropper
- ❑ Needles, thread
- ❑ Matches in a waterproof container
  Plastic storage containers
- ❑ Ziplock bags

Tools
- ❑ Assorted nails, wood screws
- ❑ Pliers, screwdriver, hammer
- ❑ Paper, Pencil
- ❑ Heavy rope
- ❑ Tape, duct tape and plumber's tape or strap iron
- ❑ Patch kit and can of seal-in-air for tires
- ❑ Shut off wrench to turn off household gas & water

You may want to include
- ❑ Family photos, jewelry and select irreplaceable personal items.
- ❑ An external Hard Drive

READY BRAZORIA COUNTY
APP
Download on the App Store or Google Play.

GETTING PREPARED

Protecting Your Boat – Marine Prep

- Check your marina contract for policies and procedures for hurricanes.
- Check with the manufacturer for proper ways to secure your boat during a storm.
- Consider moving arrangements well in advance of an approaching storm.
- Trailerable boats should be removed from the water and securely stored at least 48-hours before a hurricane is expected to make landfall.
- Purchase necessary hurricane materials such as additional mooring lines, crew anchors, fenders, fender boards, chafing gear, and anchors.
- Safe storm moorings should consist of good condition ropes of sufficient diameter and length, with at least three or four substantial anchor points.
- Do not moor parallel to bank. Receding tides often capsize boats in this type of mooring.

Business & Employee Preparation

- Identify and protect vital records. Backup and store key files off site.
- Protect electronic equipment from possible water damage.
- Have extra cash and blank checks in case extra money is needed after the storm.
- Identify a safe room for employees who must remain in the building.
- Develop a 24-hour emergency contact list with phone numbers for employees to check in and receive company information.
- Establish a temporary location for business operations in case your facility is damaged.
- Give employees enough time to secure their homes and families.
- Consider paying employees before they leave to prepare their homes.

What to do if you live in a flood-prone area:

- Buy flood insurance.
- Determine if you live behind a levee, find out who owns the levee near you, and do your part to promote levee safety.
- Visualize the impact if your levee is over-topped or breached and your neighborhood is flooded.
- Develop an emergency action plan to follow in case of flooding.
- Take advance precautions to reduce potential flood damage.
- Support funding initiatives for levee improvement projects.

GETTING PREPARED

How to prepare for a flood

BE INFORMED

- Know if you are located in a flood-prone area and your flood risk.
- Stay informed through local media, trusted social media sites, the Ready Brazoria County App, city and/or county websites.

IF YOU HAVE PETS OR LIVESTOCK

- Consider precautionary evacuation of your animals. Waiting until the last minute could be fatal for them and dangerous for you.
- Move livestock to higher ground.
- Don't leave companion animals behind if you evacuate your home. Tying up animals can cause the animal to suffer unnecessarily and be vulnerable to the elements and possible drowning.
- Prepare an animal emergency kit. The kit should include food, bowl, leash, crate, bed, toys and any medication your animal may need.

PROTECT YOUR HOME

- Clear gutters and drains. Keep gutter and drainage systems clear to carry water away from your home.
- Catalog possessions. Using a digital camcorder or camera, create a home inventory for insurance. Store digital files on a USB drive and take it with you during an evacuation event.
- Raise furniture and move expensive items to a safe location. Take irreplaceable items such as photographs and important documents with you if asked to evacuate.
- Anchor your fuel tanks. Unanchored tanks can float, rupture, and release fuel.
- Turn off your electricity at the breaker box and unplug sensitive equipment, such as computers, TV's, etc. before evacuating your home.

BE PREPARED TO EVACUATE

- If Mandatory Evacuation is issued by officials, leave the area for your safety and the safety of your family. REMEMBER, take your animals with you.
- For your safety, you will not be able to re-enter an evacuated area until area is deemed safe to return by local officials.

TURN AROUND DON'T DROWN

- Do not drive into or go near flooded streets or areas.
- Do not go around safety barriers or barricades.

tinyurl.com/BrazoriaCo

@BrazoriaCounty

@BrazoriaCounty

brazoriacountytx.gov

Download "Ready Brazoria County" on the App Store or Google Play

IF YOU NEED A RIDE OUT OF TOWN

S.T.E.A.R. REGISTRY

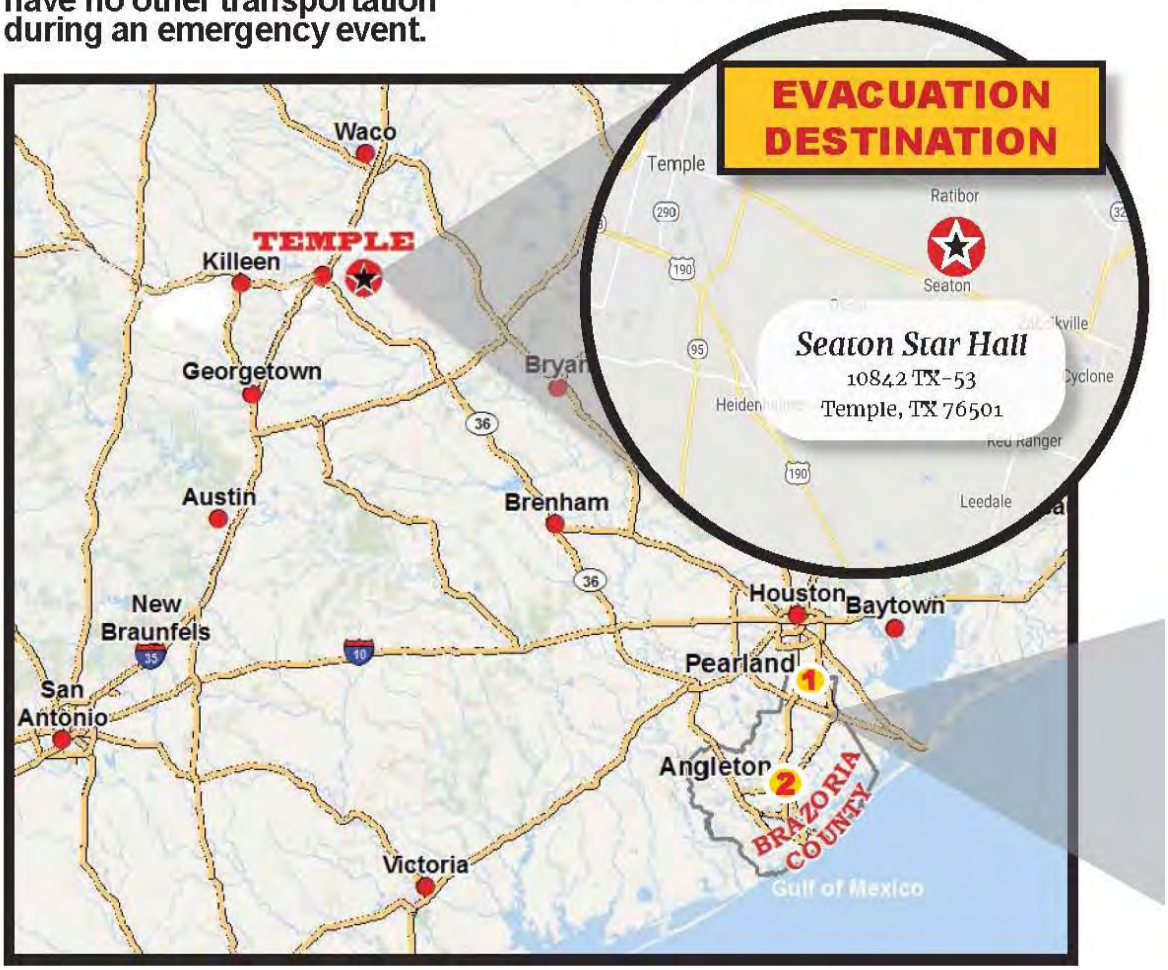
State of Texas Emergency Assistance Registry

If you need a ride to safety, during any emergency register with STEAR today!

REGISTER NOW!

This service is for people who cannot drive themselves and have no other transportation during an emergency event.

Register by dialing 2-1-1 or at: http://stear.tdem.texas.gov



IF YOU NEED A RIDE OUT OF TOWN

Evacuation HUBS in Brazoria County

What is a HUB?

A HUB is a meeting location for residents who need public transportation during an evacuation.

Residents will be checked in and bused to an evacuation shelter

HUB LOCATIONS

1 **PEARLAND**
Recreation Center
4141 Bailey Road
Pearland, TX

2 **ANGLETON**
Fairgrounds
901 S Downing Rd
Angleton, TX

If you need assistance getting to one of these HUBS, contact your emergency coordinator.
"See Pages 19-21"

What should I bring with me?

- Medications for at least 10 days.
- Driver's license or state issued picture ID.
- Sleeping pads or air mattresses.
- Blankets or a sleeping bag for each person.
- Robe & shower shoes with toiletries.
- Books, cards, games and QUIET toys for children.
- Snacks
- Five days worth of clothing
- No more than two pieces of luggage and one carry-on bag per person.
- **NO Alcoholic beverages, or illegal drugs are allowed in HUBs or on buses.**

Will my pet ride with me?

- HUB Coordinators have final say over all pet transports.
- As a general rule, pets will be transported with the owner. However, if a situation dictates, they may be transported in a separate vehicle.

Public transportation and animal evacuations

- Only non-aggressive household pets will be permitted. No reptiles or farm animals.
- Up to two pets per household will be allowed on the bus. If you feel you MUST take more than two pets, please contact your city's local emergency manager BEFORE an evacuation is called.
- All animals MUST be transported and housed in a sturdy plastic or metal cage/transport device. No cardboard or partly enclosed devices will be allowed.
- Animals must remain secured in the travel device at ALL TIMES while on the bus and at the HUB.
- Pets must have current rabies shot records.
- Owners are responsible for supplying food and water for their animals.
- We are not liable for any losses or injuries to your animals while being evacuated.

IF YOU HAVE YOUR OWN TRANSPORTATION

Evacuation Plans

How do I know when to evacuate?

Don't wait! It is NOT safe to wait. Plan to leave early.

Mandatory evacuation orders will come from your local officials. Evacuations will be based on zip codes. Please be prepared to leave immediately. See pages 19-21 for specific information pertaining to your city's communication of recommended evacuations.

Should I evacuate?

Do not wait until a mandatory evacuation is issued. Monitor conditions and leave whenever you can. Hurricanes and disasters can be extremely unpredictable and can become much more dangerous in a matter of hours.

Where should I go?

You may evacuate to any city you choose. Brazoria County residents who need shelter should go to Belton, Texas. If you do not have hotel reservations or family you can stay with, you may evacuate to the public shelters. **See map on page 6.**

What route should I take?

There are no mandatory routes you must take when evacuating from your city. In fact, there are several different routes you may take. When weather is good, take your family on an outing to check routes and become familiar with roadways and fuel locations.

The State has designated evacuation routes: SH-36, SH-288, SH-6, I-45, SH-290, HWY-59. If you choose to take an alternate route, essential services such as food, fuel, etc. are not guaranteed. Depending on the strength of the storm, contra-flow lanes might be open on SH-45, I-10, and SH-290 thirty-six (36) hours prior to the arrival of gale force winds. Plan your evacuation routes carefully (having more than one route planned), realizing that contra-flow lanes have priority over all other routes.

Seaton Star Hall Temple, Texas. Map on page 6.

When evacuating you should:

- Coordinate your departure with the people who will be traveling with you.
- Notify an out-of-area person of your evacuation plans.
- Make arrangements for your pets.
- Pack your disaster supply kit into your vehicle.
- Secure your home.
- Double check your evacuation route and leave.

Should I carry food and drinks in my car?

Yes! Stopping for food or drinks during a large scale evacuation may significantly delay you in getting to your destination. Some restaurants and stores along hurricane routes may be closed and those that are open are likely to be very crowded. Additionally, once you leave the evacuation route to purchase food or drinks, it may be difficult to re-enter the flow of traffic.

What can I do to help others?

Check on friends, neighbors and assist them if you can to make sure they can evacuate. If you cannot, help them get in touch with the local emergency management office.

! I don't want to evacuate!

Should you choose to stay there will be NO SHELTERS in Brazoria County. There will be **NO SERVICES available to you (sewer, water, electricity, etc).** Hospitals will close, ambulances will not run, and police and fire cannot respond until the storm passes.

IF YOU HAVE YOUR OWN TRANSPORTATION

Fuel

- Keep your fuel tank at least half full during hurricane season.
- Motorists should fill their tanks before evacuating.
- TxDOT works with the private sector to assure fuel availability on designated evacuation routes only.
- TxDOT courtesy vehicles will be patrolling designated evacuation routes for those stranded.

Check COUNTY road conditions online

http://tinyurl.com/BCRoadClosure

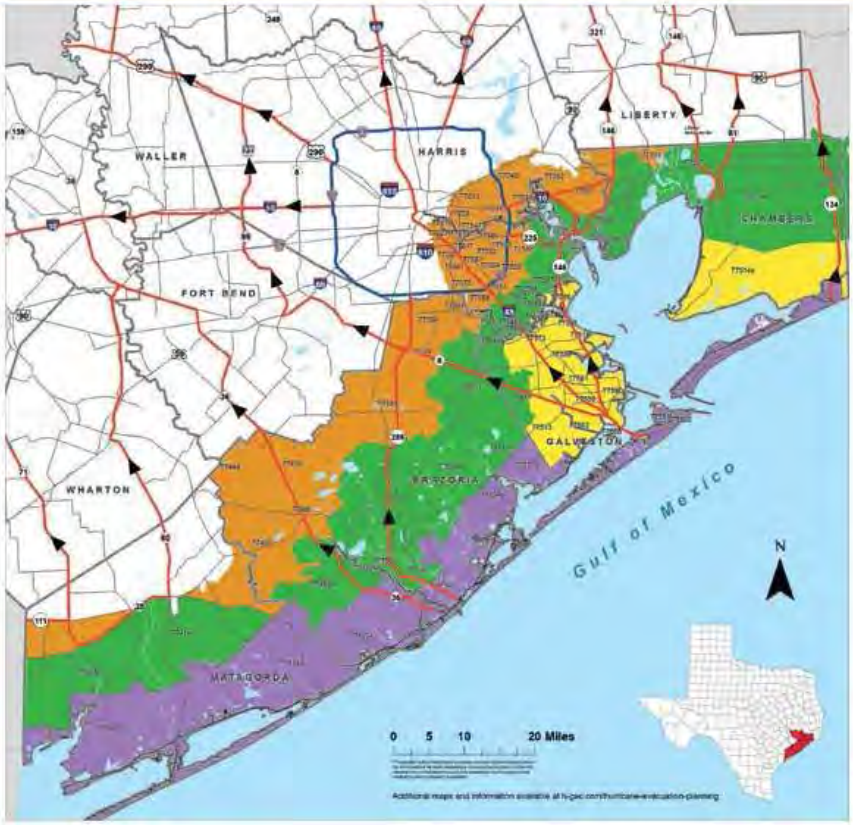
Check STATE road conditions online

drivetexas.org

Or call:1-800-452-9292

Know Your Evacuation Zone

Mandatory evacuations will be based on zip codes.
Be prepared to leave immediately after your zip code is called.



Brazoria, Chambers, Galveston, Harris, and Matagorda Hurricane Evacuation Zip-Zones Coastal, A, B, C

ZIP ZONE COASTAL
[illegible]

ZIP ZONE A
[illegible]

ZIP ZONE B
[illegible]

ZIP ZONE C
[illegible]

Route Designation

- Evacuation Corridors
- Evacuation Connections
- Other Roads
- County Boundary

IF YOU HAVE YOUR OWN TRANSPORTATION

Evacuating Pets

All food and medication must be provided by owner. If you have questions, please contact your local emergency manager (pages 19-21).

- As a general rule, pets will be sheltered separately with the exception of service animals that must stay with their owners.
- If you are evacuating to a hotel, ask about pet policies that might exist. Not all facilities accept animals.
- All animals must be housed in a sturdy plastic or metal cage.
- All food/medication must be provided by owner.

Important pet supplies

- ❑ Medications
- ❑ Food, Water
- ❑ Non-tip food and water containers
- ❑ Leash/Collar, Harness, and Carrier
- ❑ Records of Vaccinations
- ❑ Hand Sanitizer
- ❑ Waste disposal bags
- ❑ Training pads
- ❑ Towel or Blanket

Evacuating Livestock

Where to Go?

If you have friends or family who have a place to board your livestock, that is your best option. Public shelters are temporary, lasting maybe a few days. Bell County can accommodate cattle, horses, and sheep, swine and goats, high value livestock—horses, show animals, youth animal projects, etc.

When evacuating livestock, contact the County Extension Agent (254) 933-5305 before leaving home to let Bell County know you're coming. Other shelters for livestock are available throughout the state, but contact information on those sites isn't released until shortly before an evacuation. As this information is received, call the Emergency Management EOC at (979) 864-1064. Evacuation shelters provide only shelter and water. Feed and hare are the owner's responsibility.

Evacuation shelters require all equine to have current vaccinations and Coggins test paperwork.

What to Expect in an Emergency Shelter

When disasters occur, the county or state may provide a safe refuge in temporary emergency shelters. These shelters can be located in schools, churches, office buildings or other facilities. General population shelters are stocked with basic need essentials, such as food, water, and a warm place to sleep. Keep in mind, a shelter will not be able to provide the same level of comforts of home or a hotel. Shelters can be noisy, crowded, boring, short-staffed, and provide very little privacy. If you are able, staying with friends or relatives is a better choice. Items to Bring to an Emergency Shelter:

- Bring identification
- Important /insurance papers
- Bring blankets/sleeping bags, pillows
- Bring baby supplies – food, diapers, formula, medication, etc.
- Bring cards/games/books to pass the hours
- Flashlights with extra batteries
- Cell phone and charger
- Important phone numbers, i.e. family members, doctor, etc.
- Prescription and emergency medication in original containers
- Medical equipment, i.e. oxygen/wheelchair
- Extra clothing
- Specialty snacks and juices for dietary needs
- Hygiene supplies
- Shower Shoes
- Basic snacks
- Folding chairs
- Other comfort items as needed
- Pets ONLY in carriers
- Pet leashes, food bowls
- Pet health records
- No alcohol, or illegal drugs are allowed in public shelters.

Don't forget your animals supplies and necessities!

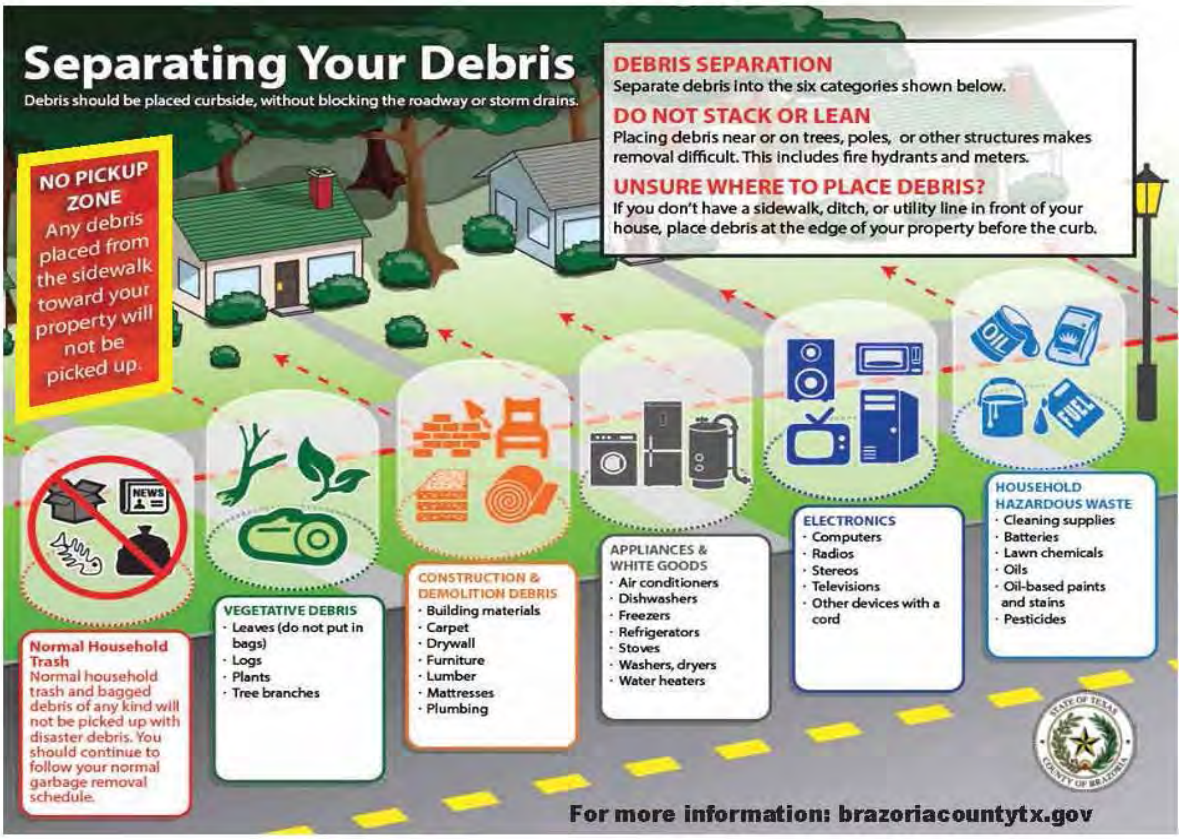
Photo provided by ASPCA

ALL HAZARD INFORMATION

WHAT TO DO AFTER A FLOOD

- Return home only when authorities say it is safe.
- Be aware of areas where floodwaters have receded and watch out for debris, snakes, fire ants, alligators, etc. Flood waters often erode roads and walkways.
- Do not wade through flood waters.
- Do not attempt to drive through areas that are still flooded.
- Avoid standing water as it may be electrically charged from underground or downed power lines.
- Photograph damage to your property for insurance purposes.

www.ready.gov/floods



Severe Weather

Thunderstorms

A thunderstorm is a storm containing lightning caused by unstable atmospheric conditions. When cold upper air sinks and warm, moist air rises, storm clouds, or "thunderheads," develop. Thunderstorms may occur by themselves, in clusters, or in lines. So, it is possible for several thunderstorms to affect one location in the course of a few hours. Some of the most severe weather occurs when a single thunderstorm affects one location for an extended period of time.

Severe thunderstorms can bring heavy rains, strong winds, hail, lightning, and tornadoes. To protect yourself in a severe thunderstorm, get inside a sturdy building away from windows and stay tuned to a battery-operated radio for weather information.

Know The Difference	
Warning	Weather hazard is occuring, imminent or likely. Poses a threat to life/property. **Take Protective Action.**
Watch	Risk of weather hazard in the near future. Could pose a threat to life/property. **Have a Plan of Action.**
Advisory	Weather hazard is occuring, imminent, or likely. Could cause significant inconvenience. **Use Caution.**

NWS Skywarn

Storm Spotter Program

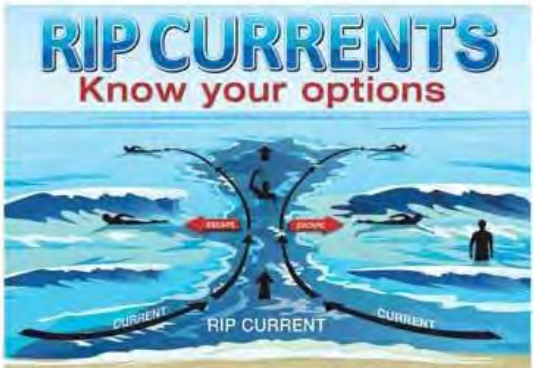
The National Weather Service issues forecasts and warnings for the protection of life and property. Severe weather reports from weather spotters are critical for the issuance of accurate and timely warnings and thus contribute to public safety. Each year the NWS offers numerous weather spotter training sessions to increase the number of spotters who can provide this critical information. Spotters are trained at how to report hazards such as hail, damaging winds, funnel clouds, tornadoes and flooding and how to identify cloud formations that indicate severe thunderstorms. Severe weather safety is also covered. The training is free, runs about two hours and is great for anyone who is interested in weather and wants to provide information directly to the National Weather Service that contribute to the safety of their communities.

For more information on the Skywarn program and to register for a course in your area refer to the following link:

https://www.weather.gov/SKYWARN

SKYWARN

ALL HAZARD INFORMATION



Rip currents are powerful currents of water moving away from shore. They can sweep even the strongest swimmer away from shore. If at all possible, swim near a lifeguard.

IF CAUGHT IN A RIP CURRENT

- Relax, rip currents don't pull you under.
- Don't swim against the current.
- Swim out of the current, then to shore.
- If you can't escape, float or tread water.
- If you need help, yell or wave for assistance.

SAFETY

- Know how to swim.
- Never swim alone.
- If in doubt, don't go out.
- Swim near a lifeguard.

More information about rip currents can be found at the following websites:

weather.gov/safety/ripcurrent/

usla.org

ALL HAZARD INFORMATION

CAER

COMMUNITY AWARENESS & EMERGENCY RESPONSE

Founded in 1985, Community Awareness & Emergency Response (CAER) is an organization made up of 20 manufacturing companies. CAER serves the Brazosport and surrounding areas, promoting emergency planning in the event of an industrial emergency. CAER works to serve as the vital link between the community and industry.

FAST FACTS

Brazosport **CAER** was the first industrial alert program of its kind in the nation.

The **CAER** ALERT SYSTEM consists of 15 strategically placed sirens in the Brazosport area that are tested each Monday at 12:10 pm for 45 seconds.

CAER sirens can be heard for a one-mile radius. They stand 50-feet high and are radio controlled.

CAER operates a 24-hour telephone alert system called CodeRED Mobile Alert. This system is geo-aware and sends alerts to registered phones in affected areas in the event of an industrial emergency. Download the app or go to brazosportcaer.com to register.

The community can call **979-238-CAER (2237)** with questions.

@BPORTCAER

www.BRAZOSPORTCAER.com

979.238.CAER (2237)

ALL HAZARD INFORMATION

DOWNLOAD THE READYBRAZORIACOUNTY APP TODAY

HELPING YOU KEEP YOUR LOVED ONES SAFE

When it comes to an emergency situation, having a plan can help protect you and your loved ones. That is why Brazoria County has developed a mobile app that helps its citizens properly prepare and stay informed during and after a disaster. You will be able to create your family emergency plan and get a list of the go-kit supplies in just under a minute. In addition, you will recieve the latest updates and necessary information on evacuation routes, shelters, available emergency services and much more, should a disaster strike.

Find peace of mind by ensuring that you and your family are properly prepared. Download the Ready Brazoria County Preparedness App and get the tool and all the information you need in one easy-to-use app.

Key Features:

- Get instant access to evacuation maps and know which routes are safe
- Find out about the nearest emergency shelters and special services in your area
- Receive latest alerts and emergency notifications from Brazoria County
- Create your personalized family emergency plan and list of go-kit supplies quickly and painlessly
- Broadcast your status ("I am safe" or "I need help") with one single tap

The app is free and is available on App Store or Google Play today!

Download on the App Store

GET IT ON Google Play

VOLUNTEER OPPORTUNITIES

AMATEUR RADIO

When your family's lives may be at risk...
What communication system do YOU want to have?

Amateur Radio Emergency Service
Make friends and enjoy the challenge!

- Get your Ham Radio License
- Practice with on-the-air "nets" or networks
- Participate in public events
- Volunteer and help others!
- Communication for disaster preparedness
- Getting the message through for your friends and your family

Website: www.brazoriacountyares.org
Contact: info@brazoriacountyares.org

HOW CAN I HELP?

BRAZORIA COUNTY CITIZEN CORPS NEEDS YOU!

In large emergencies, first responders can be quickly overwhelmed. Citizens on scene may need to take action to help save lives.

Citizen Corps will train you to prepare yourself, your family, and your neighbors for disasters.

The Brazoria County Citizen Corps has several key missions:

- Initial Neighborhood Response
- Staff Evacuation Hubs for an evacuation
- Help staff the Emergency Management Call Center
- Staff shelters during disasters
- And MUCH MORE!

ALL TRAINING IS FREE!
Positions for everyone! Great for groups and organizations! Sign up today!

See our calendar at:
www.homelandpreparedness.org
or contact Homeland Preparedness Project at:
info@homelandpreparedness.org
Or call 281-844-3653.

If you are intersted in volunteering and/or supporting Salvation Army, Freeport Corps give them a call at (979) 233-5420, or drop by at 1618 N. Avenue J, Freeport, TX

Returning Home

- Find out if it is safe to enter your community or neighborhood. Follow the advice of your local authorities.
- Check city and/or county websites
- Reliable social media sites. Ex. Brazoria County FB and/or Twitter tinyurl.com/BrazoriaCo
- Have cash with you. ATM's may not work and stores may not be able to accept credit or debit cards.
- Bring supplies such as flashlights, batteries, bottled water and nonperishable foods in case utilities are out.
- Create back-up communication plans with family and friends in case you are unable to call from affected area.
- Plan for delays when traveling. Bring extra food, water, pillows, blankets and other items that will make the trip more comfortable. Keep the fuel tank of your vehicle as full as possible in case gas stations are crowded, out of fuel or closed.
- Carry a road map to help you route around heavy traffic or impassable roads.
- Understand that recovery takes time. Focus on the positive and have patience. Others will have similar frustrations.
- If possible, leave children and pets with a relative or friend. If not, keep them away from hazards and floodwater.
- Beware of rodents, snakes, insects and other animals that may be on your property or in your home.

Items to Bring When Returning Home

- ❑ Government-issued photo ID and proof of address
- ❑ Important phone numbers
- ❑ Bottled water and non-perishable foods
- ❑ First aid kits
- ❑ Cleanser/hand cleaning gel for personal use
- ❑ Hygiene products and toilet paper
- ❑ Insect repellent and sunscreen
- ❑ Long sleeved shirts, long pants, sturdy waterproof boots and works gloves
- ❑ Flashlight, portable radio and extra batteries
- ❑ Cameras for photos of damage for insurance claims
- ❑ Tarp(s) to cover roof damage and control leaks

WELL WATER TESTING AFTER A FLOOD

Water wells that received flood water may be contaminated with bacteria, which can make you sick. Sources of bacteria may include a septic system and fecal matter from wildlife and domestic animals. Additionally, chemical contaminants can enter a well making the water unsafe to drink.

Well water can be tested at the Brazoria County Water Lab located at 409 East Orange, Angleton, Texas 77515. Water sample must be collected in a container from the lab.

Generator Safety

When the power goes out many people will turn to generators for temporary power. Before using a portable generator know the risks to insure safe and proper use.

- Never attach a generator directly to the electrical system of a structure (home, RV trailer, etc.) unless a qualified electrician has properly installed the generator with a transfer switch.
- Always plug electrical appliances directly into the generator using the manufacturer's supplied cords or extension cords that are grounded (3-pronged).
- Inspect the cords to make sure they are fully intact and not damaged.
- Do not overload a generator.
- Make sure a generator is properly grounded.
- Keep a generator dry.

Communication Information

If your city is not listed, use the County numbers.

tinyurl.com/BrazoriaCo
@BrazoriaCounty
@BrazoriaCounty
brazoriacountytx.gov
Search for "Ready Brazoria County" on the App Store or Google Play

Brazoria County

Emergency Management
pio@brazoria-county.com
24 Hour Hotline 979-864-1064
979-388-1064
281-756-1064
www.brazoriacountytx.gov

Bell County

Emergency Management
254-933-5587
www.bellcountytx.com

CAER

979-238-CAER (2237)
www.brazosportcaer.com

United Way of Brazoria County

979-849-9402
www.uwbc.org

Salvation Army

1-979-233-5420

Alvin

Emergency Manager 281-388-4363
City Hall 281-388-4200
Public Works 281-388-4325
City Manager's Office 281-388-4230
Mayor's Office 281-388-4275
Cable Access Channel . . . . . Channel 16
RADIO . . . . . KACC 89.7 FM
www.alvin-tx.gov

Angleton

Emergency Manager 979-849-2383
City Hall 979-849-4364
City Manager's Office 979-849-4364
Mayor's Office 979-849-4364
Fire 979-849-1265
www.angleton.tx.us

Bailey's Prairie

Emergency Manager 979-849-0134
Mayor 979-849-0134
Village Hall 979-849-0134
www.baileysprairie.org

Bonney

Emergency Manager/Mayor 281-595-2269
City Hall 281-595-2269
www.bonneytexas.gov

Brazoria

Emergency Manager 979-798-2489
City Hall 979-798-2489
City Manager 979-798-2489
24 hr. Emergency Info. Line 979-798-9131
www.cityofbrazoria.org

Brookside Village

Emergency Management 281-485-3048
Police Chief 281-485-4844
Mayor 281-485-3048
City Hall 281-485-3048
www.brooksidevillage-tx.org

Clute

Emergency Management 979-265-9653
Police Department 24 Hr Info 979-265-6194
Clute City Hall 979-265-2541
City Manager. 979-265-2541
www.ci.clute.tx.us

Danbury

Emergency Manager 979-264-9482
Mayor 979-264-9482
City Secretary 979-922-1551 x5
City Hall/Police Dept. 979-922-1551
Utility Dept. 979-549-3129
Fire Department 979-922-1176
Police Dispatch 979-964-2392

Freeport

Emergency Manager 979-233-2111
Information Message 979-233-KNOW
City Hall 979-233-3526
Police 979-239-1211
www.freeport.tx.us

Hillcrest

Emergency Management 832-602-9958
Monday - Friday 8 AM - 5 PM. 281-756-0577
City Office Not Open Following An Emergency
Mayor 281-748-7149
City Marshal 832-221-5961

Holiday Lakes

Mon Wed Thurs & Fri 1 - 5 PM, Tues 1 - 7 PM
Mayor 979.849.1136
Police Chief. 979-849-3163
City Secretary 979-849-1136
www.holidaylakestexas.com

Iowa Colony

Emergency Manager 281-369-3444
City Hall. 281-369-2471
Mayor 281-369-2471
City Secretary 281-369-2471
Police Chief. 281-369-3444
www.cityofiowacolony.com

Jones Creek

Marshal/Emergency Mgr. 979-292-6393
Mayor 979-233-2700
Fire Chief 979-201-3594
City Admin. 979-233-2700
Marshal's Dept 979-233-3091
City Hall 979-233-1826
www.villageofjonescreektexas.com

Lake Jackson

Emergency Manager 979-415-2500
City Hall 979-415-2400
Police Department 979-415-2700
Cable Access Channel . . . . . Channel 16
www.lakejackson-tx.gov

Liverpool

Emergency Manager 281-581-2342
Mayor 281-581-2342
City Secretary 281-581-2342
Police Chief. 281-581-2233
www.cityofliverpooltexas.com

Manvel

Mayor 281-489-0630
City Manager/EMC 281-489-0630
Police Chief 281-489-1212
Fire Marshal/Deputy EMC 281-489-0630
Fire Chief 281-692-0279
EMS Director. 281-489-6144
www.cityofmanvel.com

Oyster Creek

Emergency Manager 979-233-8481
Police Department 979-233-8481
City Administrator 979-233-0243
Mayor/City Hall 979-233-0243
Fire Department 979-233-8481
www.cityofoystercreek.org

Sign-up for the eNotification System

Pearland

Emergency Manager 281-997-4648
City Hall 281-652-1600
Mayor's Office 281-652-1654
City Manager 281-652-1663
Police Department 281-997-4100
Cable Access Channel . . . . . Channel 16/99 UVerse
www.pearlandtx.gov

Quintana

Mon. - Fri. 8 AM - 4:30 PM 979-233-0848
Mayor 979-233-4609
Emergency Manager 979-373-7255
Water Emergency 979-233-4281
www.quintanatx.org

Richwood

Mayor 979-265-2082
City Manager 979-265-2082
Emergency Manager 979-265-8157
City Hall 979-265-2082
www.richwoodtx.gov

Surfside

Police Chief . . . . . 979-233-1531 ext 109
Emergency Coordinator 979-239-1151
City Hall 979-233-1531
Fire Department 979-233-5926
www.surfsidetx.org

Sweeny

Emergency Manager 979-482-4617
City Manager/Asst. EMC 979-548-3321
EOC (Only open during Emergency Situations) 979-548-4541
Information Line 979-548-3330
After Hours 979-548-3111
www.sweenytx.gov

West Columbia

Emergency Manager 979-345-5121
City Mgr./Emergency Mgr. 979-345-3123
City Hall 979-345-3123
EOC 979-345-1900
Police Department 979-345-5121
CEMS Director 979-345-2390
Fire Chief 979-345-3416
www.westcolumbiatx.org

Other Useful Numbers

School Districts and Colleges

Alvin ISD 281-388-1130
www.alvinisd.net
Angleton ISD 979-864-8000
www.angletonisd.net
Brazosport ISD 979-730-7000
www.brazosportisd.net
Columbia-Brazoria ISD 979-799-1700
www.cbisd.com
Damon ISD 979-742-3457
www.damonisd.net
Danbury ISD 979-922-1218
www.danburyisd.org
Pearland ISD 281-485-3203
www.pearlandisd.org
Sweeny ISD 979-491-8000
www.sweenyisd.org
Alvin Community College 281-756-3500
www.alvincollege.edu
Brazosport College 979-230-3000
www.brazosport.edu
U of H - Pearland Campus 281-212-1700
www.uhcl.edu/pearland

Hospitals

UTMB Health Angleton Campus 979-849-7721
132 E. Hospital Drive Angleton, TX 77515

CHI St. Luke's Brazosport Medical Ctr . . 979-297-4411
100 Medical Drive Lake Jackson, TX 77566

Sweeny Community Hospital 979-548-3311
305 N. McKinney St Sweeny, TX 77480

Memorial Hermann Pearland 713-413-5000
16100 South Freeway Pearland, TX 77584

Pearland Medical Center 713-770-7000
11100 Shadow Creek Parkway Pearland, TX 77584

ATLANTIC HURRICANE NAMES FOR 2020

Arthur	Gonzalo	Marco	Teddy
Bertha	Hanna	Nana	Vicky
Cristobal	Isaias	Omar	Wilfred
Dolly	Josephine	Paulette	
Edouard	Kyle	Rene	
Fay	Laura	Sally	

United Way
United Way of Brazoria County

NON-PROFIT
ORGANIZATION
U.S. POSTAGE PAID
ANGLETON, TX
PERMIT NO. 38

**********ECRWSSEDDM****

Local Postal Customer

Thank You
First Responders.

To all the brave men and women who put the health and well-being of others before their own during the 2020 Public Health Emergency. We want to express our gratitude and say:

~ THANK YOU FOR ALL THAT YOU DO ~

TDEM
THE TEXAS A&M UNIVERSITY SYSTEM

December 17, 2020

The Honorable Paul Horn
Mayor, City of Alvin
216 West Sealy
Alvin, Texas 77511

RE: Approvable Pending Adoption of City of Alvin, Texas Single-Jurisdiction Hazard Mitigation Plan (HMP)

Dear Mayor Horn:

Congratulations! FEMA has concluded the review of the City of Alvin Single-Jurisdiction HMP, and the plan is found to be approvable pending adoption. In order for this plan to receive final FEMA approval, the jurisdiction(s) must adopt this plan and submit the complete adoption package to the state within 90 days. The plan update timeline will begin on the date of the FEMA approval letter. Please e-mail the complete adoption package to tdem-mitigation@tdem.texas.gov and Natalie.Johnson@tdem.texas.gov as follows:

- The final plan formatted as a single document
    - Plan must be dated to match the date of the first adoption
    - Remove track changes, strikethroughs and highlights
- All signed resolutions as a separate single document

The previous review tool may contain recommendations to be applied to your next update. DO NOT make any further changes to your plan until it has been approved.

1033 La Posada Ste 300, Austin, TX 78752
24 Hours: 512-424-2208, Fax 512-424-2444

If you have any questions concerning this procedure, please do not hesitate to contact tdem-mitigation@tdem.texas.gov. We commend you for your commitment to mitigation.

Respectfully,

Natalie Johnson

Natalie Johnson
Hazard Mitigation Planner
Recovery & Mitigation Division
Texas Division of Emergency Management