



SECTION 9. JURISDICTIONAL ANNEXES

9.10 City of Orchard

This section presents the jurisdictional annex for the City of Orchard that provides resources and information to assist public and private sectors to reduce losses from future hazard events. This annex is not guidance of what to do when a disaster occurs. Rather, this annex concentrates on actions to reduce or eliminate damage to property and people that can be implemented prior to a disaster. Information presented includes a general overview of the municipality, the City of Orchard representatives who participated in the planning process, an assessment of the City of Orchard’s risk and vulnerability, the different capabilities used in the City of Orchard, and an action plan that will be implemented to achieve a more resilient community.

9.10.1 Hazard Mitigation Planning Team

The City of Orchard identified primary and alternate points of contact and developed the 2023 Hazard Mitigation Plan (HMP) update over the course of several months with input from many City of Orchard departments, including Department of Emergency Services. The Mayor represented the community on the Fort Bend County HMP Planning Partnership and supported the local planning process requirements by securing input from persons with specific knowledge to enhance the plan. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization.

The following table summarizes municipal officials who participated in the development of the annex and in what capacity. Additional documentation on the municipality’s planning process through Planning Partnership meetings is included in Volume 1, Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.10-1. Hazard Mitigation Planning Team

Primary Point of Contact		Alternate Point of Contact	
Name/Title:	Rodney Pavlock/Mayor	Name/Title:	N/A
Address:	9714 Kibler Street	Address:	N/A
Phone Number:	(979)478-6893	Phone Number:	N/A
Email:	coforchard@twlt.net	Email:	N/A
NFIP Floodplain Administrator			
Name/Title:	Melissa Andel/Assistant Administrator *		
Address:	9714 Kibler Street		
Phone Number:	979-478-6893		
Email:	coforchard@twlt.net		
Additional Contributors:			
Name/Title:	No additional contributors		
Method of Participation:			

*Information obtained through <https://www.texasflood.org/flood-basics/fpa.html>

9.10.2 Municipal Profile

The City of Orchard is in the western part of Fort Bend County and is located along State Highway 36 and the BNSF Railway between Roseburg and Wallis in Austin County. Missouri Street is the major north-south artery, intersecting SH





36 and crossing the railroad. Missouri Street goes north as far as Brazos Elementary School. The City has a total area of .36 square miles, with all of it being land.

According to the American Community Survey, the 2021 population for the City of Orchard was 219, a 43.9 percent decrease from the 2010 Census. Data from the 2021 ACS indicates that 3.2 percent of the population is 5 years of age or younger, and 31.1 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.10.3 Jurisdictional Capability Assessment and Integration

The City of Orchard performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Volume 1, Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The jurisdictional assessment includes the following analyses:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of administrative and technical capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Classification under various community mitigation programs
- The community’s adaptive capacity to withstand hazard events

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of the hazard mitigation analysis, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress toward plan integration. The updated mitigation strategy provided an opportunity for the City of Orchard to identify opportunities for integration of mitigation concepts that can be incorporated into municipal procedures.

Planning, Legal, and Regulatory Capability and Integration

The table below summarizes the regulatory tools that are available to the City of Orchard. The comment field provides information as to how the capability integrates hazard mitigation and risk reduction.

Table 9.10-2. Planning, Legal, and Regulatory Capability and Integration

	Jurisdiction has this? (Yes/No)	Code Citation and Date (code chapter, name of plan, date of plan)	Authority (local, county, state, federal)	Individual / Department / Agency Responsible
Codes, Ordinances, & Regulations				
Building Code	Yes	Ordinance 110-16 – Standard Building Codes	Local	Code Enforcement
<i>How does this reduce risk?</i> The City of Orchard adopted the International Building Code standards in 2005.				
Zoning/Land Use Code	No	-	-	-
<i>How does this reduce risk?</i>				
Subdivision Ordinance	Yes	Ordinance 085-07- Subdivision Ordinance	Local	City Council
<i>How does this reduce risk?</i> Subdivision Ordinance regulations were adopted to provide the orderly, safe, and healthful development of the lands within the City limits or within the City’s extraterritorial jurisdiction.				
Site Plan Ordinance	No	-	-	-
<i>How does this reduce risk?</i>				



	Jurisdiction has this? (Yes/No)	Code Citation and Date (code chapter, name of plan, date of plan)	Authority (local, county, state, federal)	Individual / Department / Agency Responsible
Stormwater Management Ordinance	No	-	-	-
<i>How does this reduce risk?</i>				
Post-Disaster Recovery/ Reconstruction Ordinance	No	-	-	-
<i>How does this reduce risk?</i>				
Real Estate Disclosure	No	-	-	-
<i>How does this reduce risk?</i>				
Growth Management	No	-	-	-
<i>How does this reduce risk?</i>				
Environmental Protection Ordinance	No	-	-	-
<i>How does this reduce risk?</i>				
Flood Damage Prevention Ordinance	Yes	Flood Damage Prevention Ordinance	Local	-
<i>How does this reduce risk?</i> Dictates the minimum flood standards adopted by the City to meet the Federal standards of the National Flood Insurance Program (NFIP). Could be enhanced through higher standards adoption				
Wellhead Protection	Yes	Ordinance 002-74 – Private Water Wells	Local	City Council
<i>How does this reduce risk?</i> Ordinance making illegal the use for human consumption of water from a private water well within the corporate limits of the Town of Orchard (sic). Used to consider modifications or enhancements for water conservation and drought mitigation purposes.				
Emergency Management Ordinance	No	-	-	-
<i>How does this reduce risk?</i>				
Climate Change Ordinance	No	-	-	-
<i>How does this reduce risk?</i>				
Other	-	-	-	-
Planning Documents				
Comprehensive/Master Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Capital Improvement Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Disaster Debris Management Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Floodplain Management or Watershed Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Stormwater Management Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Open Space Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Urban Water Management Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Habitat Conservation Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Economic Development Plan	No	-	-	-



	Jurisdiction has this? (Yes/No)	Code Citation and Date (code chapter, name of plan, date of plan)	Authority (local, county, state, federal)	Individual / Department / Agency Responsible
<i>How does this reduce risk?</i>				
Shoreline Management Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Community Wildfire Protection Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Community Forest Management Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Transportation Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Agriculture Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Climate Action/ Resiliency/Sustainability Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Tourism Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Business/ Downtown Development Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Other	-	-	-	-
Response/Recovery Planning				
Comprehensive Emergency Management Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Continuity of Operations Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Strategic Recovery Planning Report	No	-	-	-
<i>How does this reduce risk?</i>				
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-
<i>How does this reduce risk?</i>				
Post-Disaster Recovery Plan	No	-	-	-
<i>How does this reduce risk?</i>				
Public Health Plan	Yes	The Fort Bend County Health and Human Services Department (FBHHS) provides public health services for the City of Orchard. FBHHS has public health plans as part of Annex H of the Fort Bend County Emergency Operations Plan.	County	FBHHS
<i>How does this reduce risk?</i>				
Other	No	-	-	-
<i>How does this reduce risk?</i>				



Development and Permitting Capability

The table below summarizes the capabilities of the City of Orchard to oversee and track development.

Table 9.10-3. Development and Permitting Capability

Indicate if your jurisdiction implements the following	Yes/No	Comment:
Do you issue development permits? • If yes, what department is responsible?	Yes	Building Department
If you do not issue development permits, what is your process for tracking new development?	N/A	-
Are permits tracked by hazard area? (For example, floodplain development permits.)	Yes	Floodplain is tracked with Floodplain certificates
Do you have a buildable land inventory? • If yes, please describe	N/A	-
Describe the level of build-out in your jurisdiction.	N/A	-

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the City of Orchard and their current responsibilities that contribute to hazard mitigation.

Table 9.10-4. Administrative and Technical Capabilities

Resources	Available? (Yes/No)	Comments (available staff, responsibilities, support of hazard mitigation)
Administrative Capability		
Planning Board	No	-
Zoning Board of Adjustment	No	-
Planning Department	No	-
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	Yes	Economic Development Council
Public Works/Highway Department	Yes	Water and Sewer Manager
Construction/Building/Code Enforcement Department	No	-
Emergency Management/Public Safety Department	Yes	Elected Official
Warning Systems / Services (mass notification system, outdoor warning signals, etc.)	No	-
Maintenance programs to reduce risk (stormwater maintenance, tree trimming, etc.)	No	-
Mutual aid agreements	No	-
Human Resources Manual	No	Consider the following: Do any job descriptions specifically include identifying or implementing mitigation projects or other efforts to reduce natural hazard risk?
Other	Yes	City Administrator
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	No	-



Resources	Available? (Yes/No)	Comments (available staff, responsibilities, support of hazard mitigation)
Engineers or professionals trained in building or infrastructure construction practices	Yes	Dictates the minimum flood standards adopted by the City to meet the Federal standards of the National Flood Insurance Program (NFIP).
Planners or engineers with an understanding of natural hazards	No	-
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	No	-
Environmental scientist familiar with natural hazards	No	-
Surveyor(s)	No	-
Emergency manager	Yes	Elected Official
Grant writer(s)	No	-
Resilience officer		
Other (this could include stormwater engineer, environmental specialist, etc.)	No	-

Fiscal Capability

The table below summarizes financial resources available to the City of Orchard.

Table 9.10-5. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use? (Yes/No)
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital improvements project funding	No
Authority to levy taxes for specific purposes	Yes
User fees for water, sewer, gas, or electric service	Yes
Impact fees for homebuyers or developers of new development/homes	No
Stormwater utility fee	No
Incur debt through general obligation bonds	No
Incur debt through special tax bonds	Yes
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	Yes
Other federal or state funding programs	Yes
Open space acquisition funding programs	No
Other (for example, Clean Water Act 319 Grants [Nonpoint Source Pollution])	-

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the City of Orchard.

Table 9.10-6. Education and Outreach Capabilities

Outreach Resources	Available? (Yes/No)	Comment:
Public information officer or communications office	No	-
Personnel skilled or trained in website development	No	-
Hazard mitigation information available on your website	No	-
Social media for hazard mitigation education and outreach	No	-



Outreach Resources	Available? (Yes/No)	Comment:
Citizen boards or commissions that address issues related to hazard mitigation	No	-
Warning systems for hazard events	No	-
Natural disaster/safety programs in place for schools	No	-
Does the jurisdiction have any public outreach mechanisms / programs in place to inform citizens on natural hazards, risk, and ways to protect themselves during such events? <ul style="list-style-type: none"> If yes, please describe. 	No	-

Community Classifications

The table below summarizes classifications for community programs available to the City of Orchard.

Table 9.10-7. Community Classifications

Program	Participating? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	No	-	-
Storm Ready Certification	No	-	-
Firewise Communities classification	No	-	-
Other	No	-	-

Adaptive Capacity

Adaptive capacity is defined as “the ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences” (IPCC 2014). Each jurisdiction has a unique combination of capabilities to adjust to, protect from, and withstand a future hazard event, future conditions, and changing risk. The table below summarizes the adaptive capacity for each identified hazard of concern and the jurisdiction’s capability to address related actions using the following classifications:

- Strong: Capacity exists and is in use.
- Moderate: Capacity might exist but is not used or could use some improvement.
- Weak: Capacity does not exist or could use substantial improvement.

Table 9.10-8. Adaptive Capacity

Hazard	Adaptive Capacity – Strong/Moderate/Weak
Dam/Levee Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Extreme Temperature	Moderate
Flood	Moderate
Geologic Hazards	Moderate
Hurricane/Tropical Storm	Moderate
Severe Weather	Moderate
Tornado	Moderate



Hazard	Adaptive Capacity – Strong/Moderate/Weak
Wildfire	Moderate
Winter Weather	Moderate

9.10.4 National Flood Insurance Program (NFIP) Compliance

This section provides specific information on the management and regulation of the regulatory floodplain, including current and future compliance with the NFIP. The Floodplain Administrator is responsible for maintaining this information and is listed in the Hazard Mitigation Planning Team table at the beginning of this annex.

National Flood Insurance Program (NFIP) Summary

The following table summarizes the NFIP statistics for the City of Orchard.

Table 9.10-9. NFIP Summary

Municipality	Policies in Force ^a	Number of Paid Claims ^a	Amount of Paid Claims ^a	Number of NFIP RL Properties ^b	Number of NFIP SRL Properties ^b
Orchard (C)	8	6	\$213,258.75	0	0

Sources: a BureauNet 2022 (<https://nfipservices.floodsmart.gov/reports-flood-insurance-data>)
 b 2018 Fort Bend County HMP

Notes: Due to a contractual agreement with FEMA, detailed information at the municipal level was not available to incorporate into the 2023 HMP Update. The information presented here was collected from data provided by the State of Texas and from FEMA's HUDEX Report.

*Number of RL and SRL properties provided by the State of Texas

**Total policies in force and paid claims collected from FEMA's OpenFEMA Dataset: FIMA NFIP Redacted Claims

RL Repetitive Loss
 SRL Severe Repetitive Loss

Flood Vulnerability Summary

The following table provides a summary of the NFIP program in the City of Orchard.

Table 9.10-10. NFIP Summary

NFIP Topic	Comments
Flood Vulnerability Summary	
Describe areas prone to flooding in your jurisdiction. <ul style="list-style-type: none"> Do you maintain a list of properties that have been damaged by flooding? 	There are no areas prone to flooding in the City. Occasional flooding will occur during heavy rains due to stormwater. No
<ul style="list-style-type: none"> Do you maintain a list of property owners interested in flood mitigation? How many homeowners and/or business owners are interested in mitigation (elevation or acquisition)? 	No None
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what projects are underway. 	None
How do you make Substantial Damage determinations? <ul style="list-style-type: none"> How many were declared for recent flood events in your jurisdiction? 	The City does not have a Substantial Damage Management Plan in place, nor do they have a formal process in place when conducting substantial damage determinations. The City is in need of a formal process and plan to provide a framework for conducting such inspections and determinations. No SD declarations for recent flood events.
How many properties have been mitigated (elevation or acquisition) in your jurisdiction?	None



NFIP Topic	Comments
<ul style="list-style-type: none"> If there are mitigated properties, how were the projects funded? 	
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If not, state why. 	Yes
NFIP Compliance	
What local department is responsible for floodplain management?	Building department
Are any certified floodplain managers on staff in your jurisdiction?	No
Do you have access to resources to determine possible future flooding conditions from climate change?	Yes, FEMA resources online
Does your floodplain management staff need any assistance or training to support its floodplain management program? <ul style="list-style-type: none"> If so, what type of assistance/training is needed? 	Yes, any training
Provide an explanation of NFIP administration services you provide (e.g. permit review, GIS, education/outreach, inspections, engineering capability)	Permit Reviews, Inspections
How do you determine if proposed development on an existing structure would qualify as a substantial improvement?	N/A
What are the barriers to running an effective NFIP program in the community, if any?	Staffing, training, and funds
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state the violations. 	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	Unknown
What is the local law number or municipal code of your flood damage prevention ordinance? <ul style="list-style-type: none"> What is the date that your flood damage prevention ordinance was last amended? 	Dictates the minimum flood standards adopted by the City to meet the Federal standards of the NFIP; could be enhanced through higher standards adoption
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	Meets
Are there other local ordinances, plans or programs (e.g. site plan review) that support floodplain management and meeting the NFIP requirements? For instance, does the planning board or zoning board consider efforts to reduce flood risk when reviewing variances such as height restrictions?	No
Does your community plan to join the CRS program or is your community interested in improving your CRS classification?	No

9.10.5 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to appreciating a jurisdiction’s overall risk to its hazards of concern. The table below summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development.

Table 9.10-11. Number of Building Permits for New Construction

Type of Development	2018	2019	2020	2021	2022
Number of Building Permits for New Construction Issued Since the previous HMP* (total/within regulatory floodplain)					





Type of Development	2018		2019		2020		2021		2022	
	Total	Within SFHA	Total	Within SFHA	Total	Within SFHA	Total	Within SFHA	Total	Within SFHA
Single Family	-	-	-	-	-	-	-	-	-	-
Multi-Family	-	-	-	-	-	-	-	-	-	-
Other (commercial, mixed-use, etc.)	-	-	-	-	-	-	-	-	-	-
Total Permits Issued	-	-	-	-	-	-	-	-	-	-

SFHA Special Flood Hazard Area (1% annual chance flood event)

* Only location-specific hazard zones or vulnerabilities identified.

Table 9.10-12. Recent and Expected Future Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Address and Parcel ID	Known Hazard Zone(s)	Description/Status of Development
Recent Major Development from 2018 to Present					
None Identified					
Known or Anticipated Major Development in the Next Five (5) Years					
None Identified					

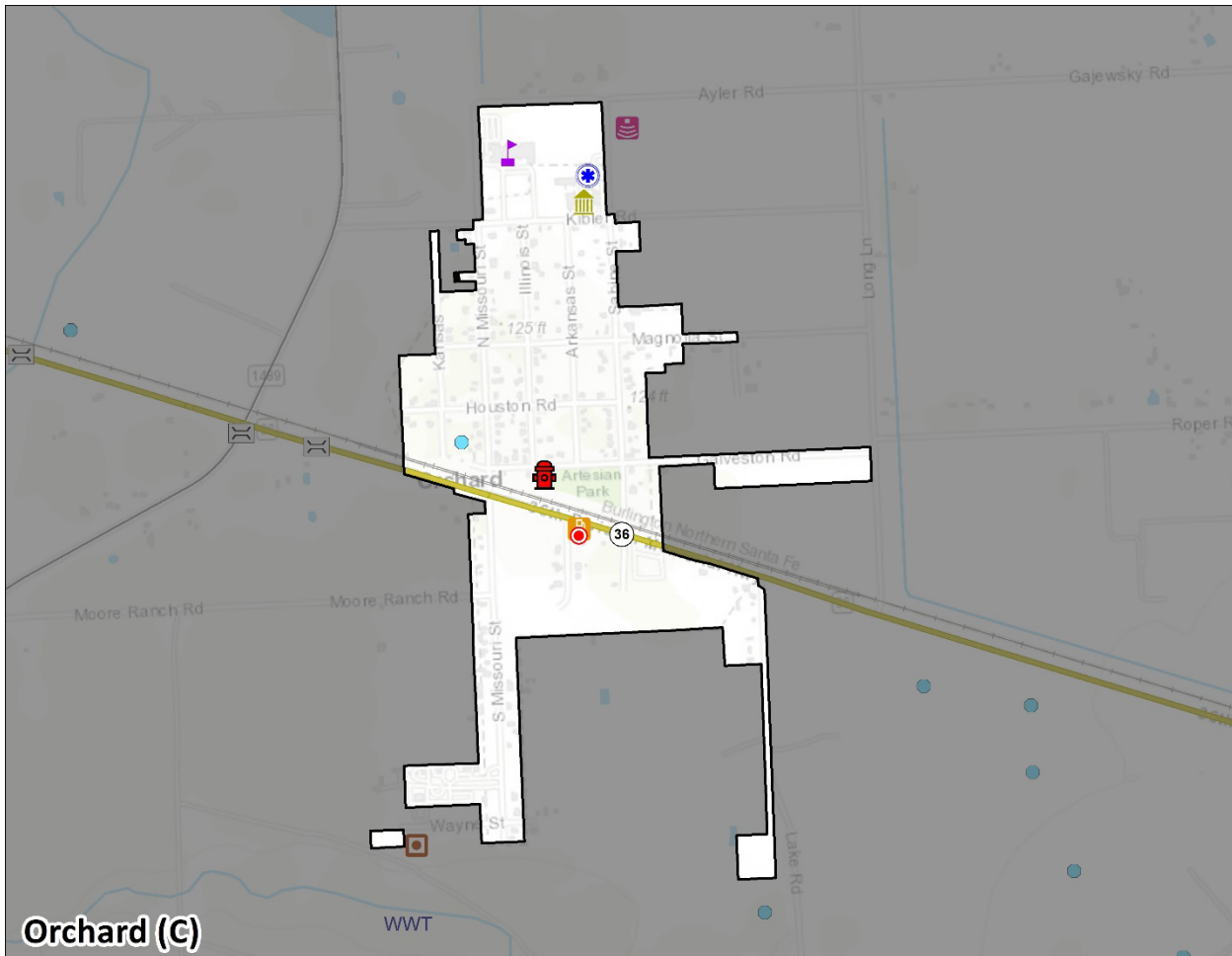
9.10.6 Jurisdictional Risk Assessment

The hazard profiles in Volume 1, Section 4 (Risk Assessment) provide detailed information regarding each plan participant’s vulnerability to the identified hazards. Section 4.1 (Methodology and Tools) and Section 4.4 (Hazard Ranking) provide detailed summaries for the City of Orchard’s risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard area extent and location maps provided below illustrate the probable areas impacted within the jurisdiction based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps were generated only for those hazards that can be identified clearly using mapping techniques and technologies and for which the City of Orchard has significant exposure. The maps also show the location of potential new development, where available.



Figure 9.10-1. City of Orchard Hazard Area Extent and Location Map-Dam Inundation



Orchard (C)

- | | | | |
|-----------------------------------|----------------------------|--------------------------|------------------|
| Airport | Hazardous Materials | Potable Water Tower | County Boundary |
| Alternative/Specialized Education | Hospital | Potable Water Well | Interstate |
| Bridge | Library | Primary Education | U.S. Highway |
| Bus Station | Major Employer | Private Water Well | State Highway |
| Cellular Transmission | Medical Clinic | Public Water Well | Toll Road |
| Church | Municipal Hall | Public Works | County Road |
| Community Center | Museum | Radio Broadcast | Railroad |
| Correctional Facility | Outfall | Secondary Education | Waterbody |
| Dam | Petroleum Storage Tank | Senior Care | Barker Reservoir |
| EMS Station | Pharmacy | Stormwater Pump Station | Kitty Hollow Dam |
| EOC | Police Station | TV Broadcast | Lake Sommerville |
| Electric Power | Post-Secondary Education | Urgent Care | |
| Fire Station | Potable Water Facility | Wastewater Lift Station | |
| Gas Station | Potable Water Pump Station | Water Treatment Facility | |
| Government Office | Potable Water Tank | | |
- WWT Wastewater Treatment Plant

0 0.125 0.25 Miles

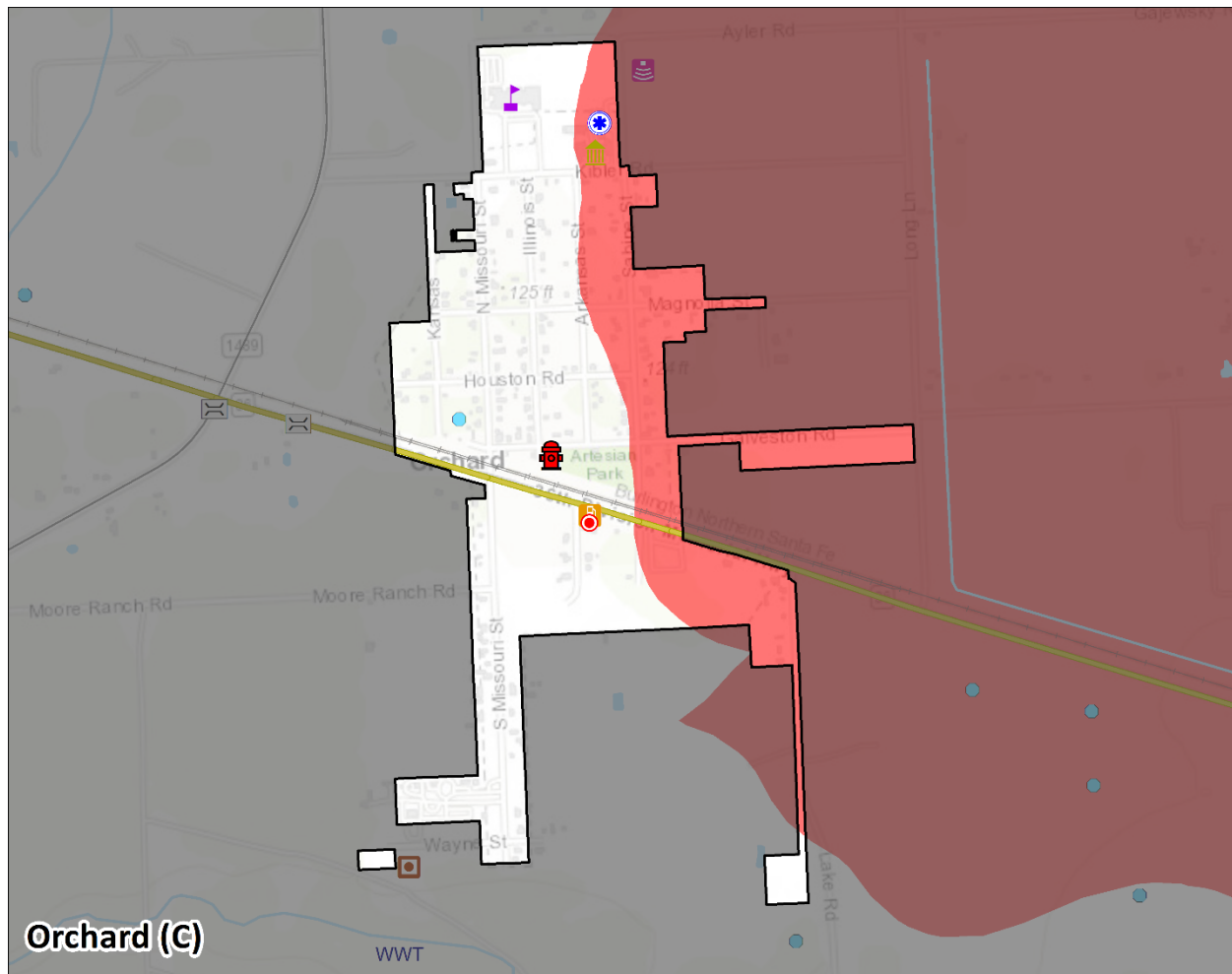
Data Sources: U.S. Geological Survey, National Geospatial Program 2022; Texas Department of Transportation 2022; U.S. Army Corp of Engineers 2023

Notes: City (C), Township (T), Village (V)





Figure 9.10-2. City of Orchard Hazard Area Extent and Location Map-Expansive Soils



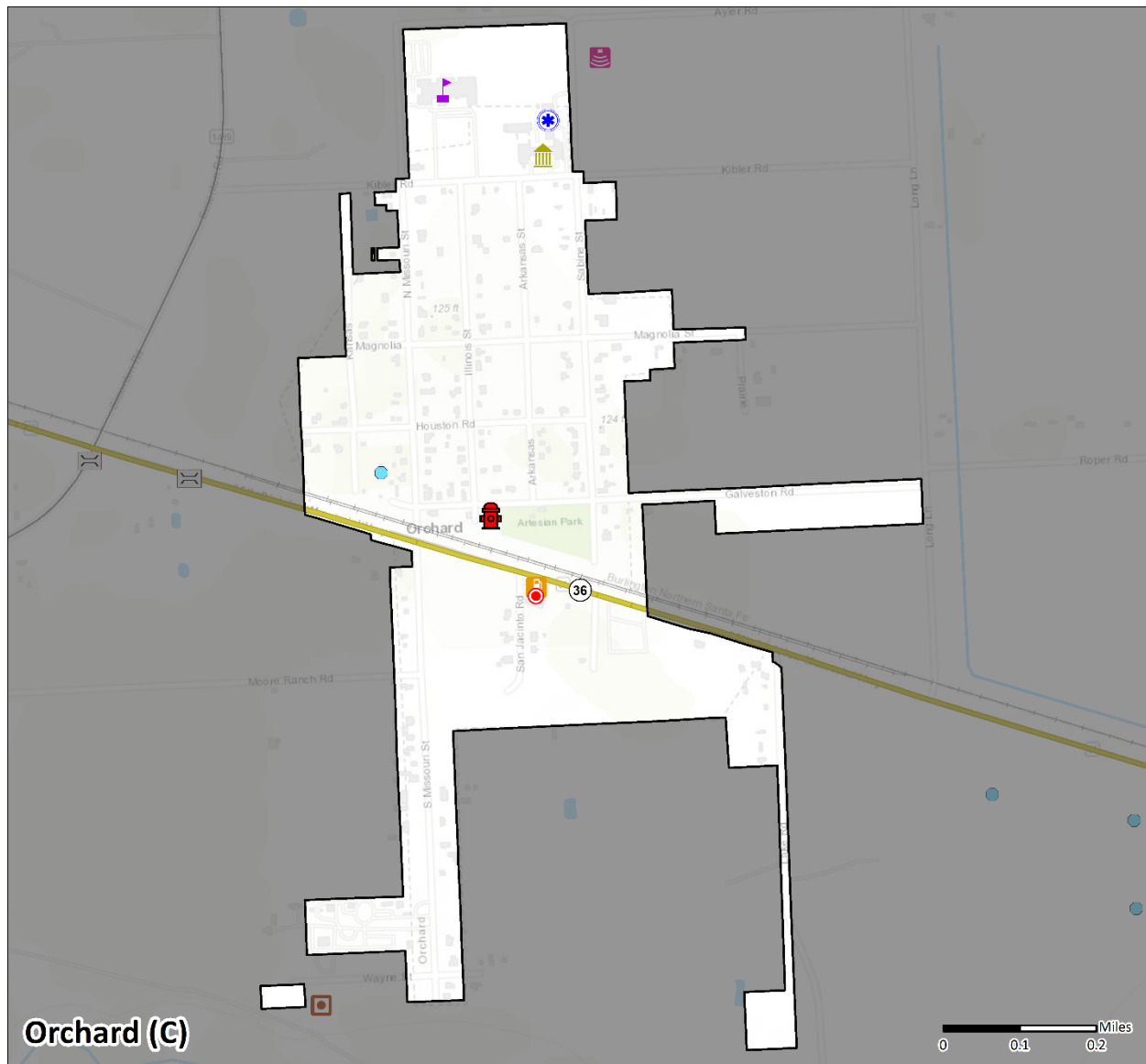
Orchard (C)

Airport	Hazardous Materials	Potable Water Tank	County Boundary
Alternative/Specialized Education	Hospital	Potable Water Tower	Interstate
Bridge	Library	Potable Water Well	U.S. Highway
Bus Station	Major Employer	Primary Education	State Highway
Cellular Transmission	Medical Clinic	Private Water Well	Toll Road
Church	Municipal Hall	Public Water Well	County Road
Community Center	Museum	Public Works	Railroad
Correctional Facility	Outfall	Radio Broadcast	Waterbody
Dam	Petroleum Storage Tank	Secondary Education	Expansive Soils Hazard Area
EMS Station	Pharmacy	Senior Care	Linear Extensibility >6%
EOC	Police Station	Stormwater Pump Station	North Arrow
Electric Power	Post-Secondary Education	TV Broadcast	0 0.125 0.25 Miles
Fire Station	Potable Water Facility	Urgent Care	Data Sources: U.S. Geological Survey, National Geospatial Program 2022; Texas Department of Transportation 2022; U.S. Department of Agriculture, Natural Resources Conservation Service 2022
Gas Station	Potable Water Pump Station	Wastewater Lift Station	Notes: City (C), Township (T), Village (V)
Government Office		Water Treatment Facility	





Figure 9.10-3. City of Orchard Hazard Area Extent and Location Map-Flood



Orchard (C)

- | | | | |
|-----------------------------------|----------------------------|----------------------------|---|
| Airport | Hazardous Materials | Potable Water Tank | County Boundary |
| Alternative/Specialized Education | Hospital | Potable Water Tower | Interstate |
| Bridge | Library | Potable Water Well | U.S. Highway |
| Bus Station | Major Employer | Primary Education | State Highway |
| Cellular Transmission | Medical Clinic | Private Water Well | Toll Road |
| Church | Municipal Hall | Public Water Well | County Road |
| Community Center | Museum | Public Works | Railroad |
| Correctional Facility | Outfall | Radio Broadcast | Waterbody |
| Dam | Petroleum Storage Tank | Secondary Education | FEMA Flood Hazard Area |
| EMS Station | Pharmacy | Senior Care | 1% Annual Chance |
| EOC | Police Station | Stormwater Pump Station | 0.2% Annual Chance |
| Electric Power | Post-Secondary Education | TV Broadcast | <i>The flood hazard area depicted is the January 29, 2021 FEMA effective DFIRM with the latest LOMR date of August 10, 2022</i> |
| Fire Station | Potable Water Facility | Wastewater Lift Station | |
| Gas Station | Potable Water Pump Station | Wastewater Treatment Plant | <small>Data Sources: U.S. Geological Survey, National Geospatial Program 2022; Texas Department of Transportation 2022</small> |
| Government Office | | Water Treatment Facility | <small>Notes: City (C), Township (T), Village (V)</small> |



Figure 9.10-4. City of Orchard Hazard Area Extent and Location Map-Inland Erosion

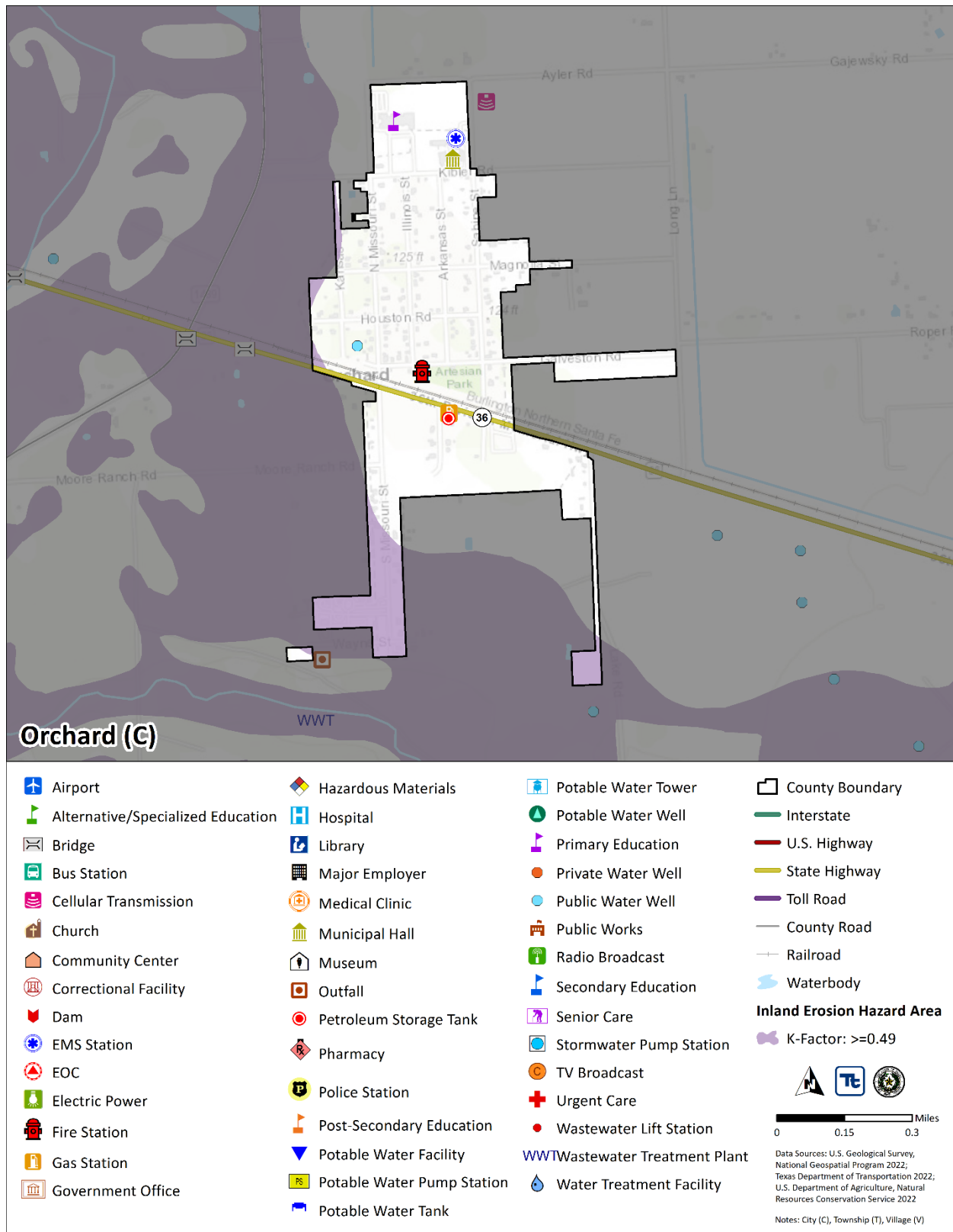
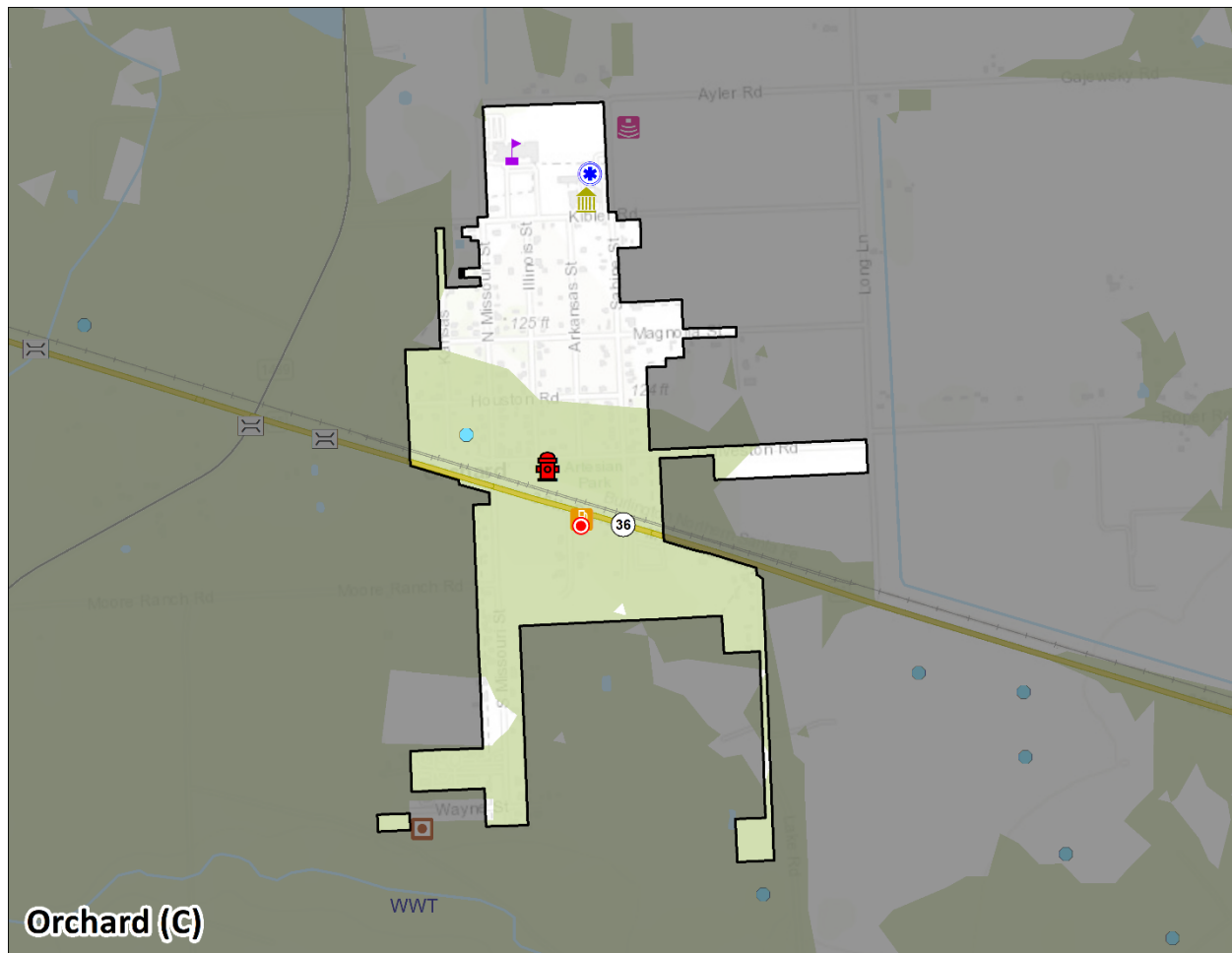




Figure 9.10-5. City of Orchard Hazard Area Extent and Location Map-Wildfire



Orchard (C)

Airport	Hazardous Materials	Potable Water Tower	County Boundary
Alternative/Specialized Education	Hospital	Potable Water Well	Interstate
Bridge	Library	Primary Education	U.S. Highway
Bus Station	Major Employer	Private Water Well	State Highway
Cellular Transmission	Medical Clinic	Public Water Well	Toll Road
Church	Municipal Hall	Public Works	County Road
Community Center	Museum	Radio Broadcast	Railroad
Correctional Facility	Outfall	Secondary Education	Waterbody
Dam	Petroleum Storage Tank	Senior Care	Wildfire Hazard Area
EMS Station	Pharmacy	Stormwater Pump Station	Low Threat
EOC	Police Station	TV Broadcast	Moderate Threat
Electric Power	Post-Secondary Education	Urgent Care	Wastewater Lift Station
Fire Station	Potable Water Facility	Wastewater Lift Station	Water Treatment Facility
Gas Station	Potable Water Pump Station	WWT Wastewater Treatment Plant	
Government Office	Potable Water Tank		

Data Sources: U.S. Geological Survey, National Geospatial Program 2022, Texas Department of Transportation 2022, Texas A&M Forest Service 2022
 Notes: City (C), Township (T), Village (V)





Hazard Event History

Fort Bend County has a history of natural and non-natural hazard events, as detailed in Volume I, Section 4 (Risk Assessment). A summary of historical events is provided in each of the hazard profiles and includes a chronology of events that have affected the County and its municipalities.

The City of Orchard’s history of federally declared (as presented by FEMA) and significant hazard events [as presented in NOAA-National Centers for Environmental Information (NCEI)] is consistent with that of the County. The table below provides details regarding municipal-specific loss and damages the City of Orchard experienced during hazard events since the last HMP update. Information provided in the table below is based on reference material or local sources.

Table 9.10-13. Hazard Event History

Dates of Event	Event Type (Disaster Declaration if applicable)	County Designated?	Summary of Event	Municipal Summary of Damages and Losses
January 20, 2020 – continuing	EM-3458 – Covid-19; DR-4485 – Covid-19 Pandemic	Yes	COVID-19 pandemic	The City did not incur additional damages or losses that were documented.
July 25-31, 2020	EM-3530 – Hurricane Hanna	Yes	Hurricane-force winds resulted in significant number of downed trees and utility lines.	The City did not incur additional damages or losses that were documented.
August 23-27, 2020	EM-3540 – Tropical Storms Marco and Laura	Yes	Fort Bend County activated their emergency operations center as fringe impacts of Tropical Storms Marco and Laura impacted the County.	The City did not incur additional damages or losses that were documented.
September 12-18, 2021	EM-3572 Hurricane Nicholas	No	Hurricane Nicholas produced several hours of tropical storm-force sustained winds and gusts. There were numerous power outages and minor to moderate damage to some structures and roofs. Trees down in areas.	The City did not incur additional damages or losses that were documented.
February 11-21, 2021	DR-4586; EM 3554 – Severe Winter Storms	Yes	Winter Storm Uri distributed a record amount of snow throughout Texas. Snow, ice, and ultra-low temperatures caused widespread road closures.	The City did not incur additional damages or losses that were documented.

Source: FEMA 2023; NOAA 2023

Hazard Ranking and Vulnerabilities

The hazard profiles in Volume 1, Section 4 (Risk Assessment) have detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the City of Orchard’s risk assessment results and data used to determine the hazard ranking.

Hazard Ranking

This section provides the community-specific identification of the primary hazard concerns based on identified problems, impacts, and the results of the risk assessment as presented in Volume 1, Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; the potential impacts of the hazard on people, property, and the economy; and community capabilities to address the hazard and changing future climate conditions. Mitigation action development uses the inputs from the evaluation to target those hazards with highest level of concern.





As discussed in Volume 1, Section 4.4 (Hazard Ranking), each participating jurisdiction has differing degrees of risk exposure and vulnerability compared with the County as a whole. Therefore, each municipality ranked the degree of risk to each hazard as it pertains to their community. The table below summarizes the hazard risk/vulnerability rankings of potential natural hazards for the City of Orchard. The City of Orchard reviewed the County hazard risk/vulnerability risk ranking table and individual results to reflect the relative risk of the hazards of concern to the community.

Table 9.10-14. Hazard Ranking Input

Hazard	Rankings
Dam/Levee Failure	Low
Disease Outbreak	Medium
Drought	Medium
Extreme Temperature	Medium
Flood	Low
Geologic Hazards	Medium
Hurricane/Tropical Storm	Medium
Severe Weather	High
Tornado	Medium
Wildfire	Low
Winter Weather	Low

Critical Facilities

The table below identifies the number of critical facilities and community lifelines in the community located in hazard areas. The community reviewed the list of facilities and lifelines to determine appropriate mitigation measures for the facilities, where appropriate. Refer to Section 4.3 (Hazard Profiles) for details on the risk assessment and the facilities and lifelines exposed to each hazard of concern.



Table 9.10-15. Potential Flood Losses to Critical Facilities

Jurisdiction	1-Percent Annual Chance Flood Event Hazard Area		Wildfire Hazard Area – Moderate Risk		Inland Erosion (K-Factor: ≥ 0.49) Hazard Area		Expansive Soils (Linear Extensibility $>6\%$) Hazard Area		Dam Inundation Hazard Area - Barker Reservoir Dam Inundation Area		Dam Inundation Hazard Area - Lake Sommerville Dam Inundation Area		Dam Inundation Hazard Area - Kitty Hollow Dam Inundation Area	
	Critical Facilities	Lifelines	Critical Facilities	Lifelines	Critical Facilities	Lifelines	Critical Facilities	Lifelines	Critical Facilities	Lifelines	Critical Facilities	Lifelines	Critical Facilities	Lifelines
Orchard (C)	0	1	0	0	0	0	2	2	0	0	0	0	0	0

Source: Fort Bend County; Hazus v5.1; FEMA 2022; Fort Bend Drainage District 2023



Identified Issues

After review of the City of Orchard’s hazard event history, hazard rankings, jurisdiction specific vulnerabilities, hazard area extent and location, and current capabilities, the City of Orchard identified the following vulnerabilities within their community:

- The City cannot expand the City limits due to the shortened span of the water lines. Additionally, the City struggles to combat wildfire prior to the hazard entering City lines.
- The City does not have a hazard warning system in place that helps protect and warn residents against incoming hazard events.
- The City does not currently have a Continuity of Operations Plan to implement in the event a hazard disrupts the City’s function.
- The City does not have a Substantial Damage Management Plan in place, nor do they have a formal process in place when conducting substantial damage determinations. The City is in need of a formal process and plan to provide a framework for conducting such inspections and determinations.

**This issue was identified as a specific area of concern based on resident response to the Fort Bend County Hazard Mitigation public survey.*

9.10.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritizes actions to address over the next five years.

Past Mitigation Initiative Status

The following table indicates progress on the community’s mitigation strategy identified in the 2018 HMP. Actions that are in progress are carried forward and combined with new actions as part of this plan update and are included in the tables with prioritization. Previous actions that are now ongoing programs and capabilities are indicated as such and previously presented in the Capability Assessment earlier in this annex.



Table 9.10-16. Status of Previous Mitigation Actions

Project	Responsible Party	What is the status? (e.g., In Progress, No Progress, Ongoing Capability, or Completed) If in progress or completed, please describe the funding source, cost, and who is implementing.	If you did not complete the action, should the action be included in the 2023 HMP (i.e., there is still a need, this is still a priority)?		
			Yes/No	If Yes, please describe the original problem (i.e., hazard, location, historic losses)	If Yes, identify the responsible department/person to implement the project.
Reinforcement of Critical Facilities	City of Orchard Engineer	No Progress	No	-	-
Retrofit Existing Public-School Buildings	City of Orchard Engineer	No Progress	No	-	-
Increase Public Awareness of Hazard Mitigation	City of Orchard City Hall	No Progress	No	-	-
Evacuation Plans	City of Orchard City Hall	No Progress	No	-	-
Wildfire Hazard Areas	City of Orchard City Hall	No Progress	No	-	-
Monitor Drought Conditions	City of Orchard City Hall	No Progress	No	-	-
Public Information Campaigns	City of Orchard City Hall	No Progress	No	-	-
Evaluate Excess Heat Risks	City of Orchard City Hall	No Progress	No	-	-
Address High Risk Populations (excessive heat)	City of Orchard City Hall	No Progress	No	-	-
Review Plans and Resources to Address Risk Posed by Snow and Ice Hazards during winter storms	City of Orchard City Hall	No Progress	No	-	-
Various Mitigation Actions to reduce Wildfire Risk	City of Orchard City Hall	No Progress	No	-	-
Upgrades to At-Risk Structures and higher Standards for New Structures	City of Orchard Engineer	No Progress	No	-	-
Install Ground System/Surge Protections	City of Orchard Engineer	No Progress	No	-	-
Review City Ordinance and Building Codes	City of Orchard City Hall	No Progress	No	-	-



Additional Mitigation Efforts

In addition to the mitigation initiatives completed in the table above, the City of Orchard identified the following mitigation efforts completed since the last HMP:

- None identified

Since the adoption of the County’s first HMP, the City of Orchard has made significant mitigation progress in the following areas:

- None identified

Proposed Hazard Mitigation Initiatives for the HMP Update

Fort Bend County participated in a mitigation action workshop in March 2023 and was provided the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards (January 2013) and FEMA Mitigation Assistance Resource Guide for Texas (2020).

The table below indicates the range of proposed mitigation action categories. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table to further demonstrate the wide range of activities and mitigation measures selected.

Table 9.10-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	FEMA				CRS					
	LPR	SIP	NSP	EAP	PR	PP	PI	NR	SP	ES
Dam/Levee Failure	-	-	-	X	-	-	-	-	-	X
Disease Outbreak	-	-	-	X	-	-	-	-	-	X
Drought	-	-	-	X	-	-	-	-	-	X
Extreme Temperature	-	-	-	X	-	-	-	-	-	X
Flood	-	-	-	X	-	-	-	-	-	X
Geologic Hazards	-	-	-	X	-	-	-	-	-	X
Hurricane/Tropical Storm	-	-	-	X	-	-	-	-	-	X
Severe Weather	-	-	-	X	-	-	-	-	-	X
Tornado	-	-	-	X	-	-	-	-	-	X
Wildfire	-	X	-	X	-	X	-	-	-	X
Winter Weather	-	-	-	X	-	-	-	-	-	X

Note: Mitigation categories are described below the Mitigation Initiatives.



The table below summarizes the specific mitigation initiatives the City of Orchard would like to pursue in the future to reduce the effects of hazards. The initiatives are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities.

Table 9.10-18. Proposed Hazard Mitigation Initiatives

Project Number	Mitigation Initiative Name	Description of Problem and Solution	Hazard(s) to be Mitigated	Goals Met	Estimated Timeline	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Costs	Priority	Mitigation Category	CRS Category
2023-City of Orchard-001	Expand Water Lines	Problem: The City cannot expand the City limits due to the shortened span of the water lines. Additionally, the City struggles to combat wildfire prior to the hazard entering City lines. Solution: The City will do an engineering study to figure out how to expand the waterlines out of the City limits in order to be able to expand the City and better protect the City from the wildfire hazard.	Wildfire	2, 3	5 Years	Fire Department, Public Works, County	HMGP, BRIC, City Budget, County Budget	The City will be better protected from the wildfire hazard.	>\$300,000	High	SIP	ES,PP
2023-City of Orchard-002	Warning systems for hazard events	Problem: The City does not have a hazard warning system in place that helps protect and warn residents against incoming hazard events. Solution: The City will work to acquire necessary funding to install a hazard warning system that operates using outdoor sirens and notifications on cell phones to protect their residents.	Dam/Levee Failure, Disease Outbreak, Drought, Extreme Temperature, Flood, Geologic Hazards, Hurricane/Tropical Storm, Severe Weather, Tornado, Wildfire, Winter Weather	2	Less than 5 years	City Administration	BRIC, HMGP, FMA	Residents will have increased warning time before a hazard event affects the City.	\$50,000	High	EAP	ES
2023-City of Orchard-003	Develop a Continuity of Operations Plan	Problem: The City does not currently have a Continuity of Operations Plan to implement in the event a hazard disrupts the City's function. Solution: The City will develop a Continuity of Operations Plan and integrate the current HMP into it so that the Plan covers all the City's hazards of concern.	Dam/Levee Failure, Disease Outbreak, Drought, Extreme Temperature, Flood, Geologic Hazards,	2	1 Year	City Planning Department	HMGP, City	The City will have a fully developed plan in case of hazard disruptions.	\$5,000	High	LPR	ES



Project Number	Mitigation Initiative Name	Description of Problem and Solution	Hazard(s) to be Mitigated	Goals Met	Estimated Timeline	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Costs	Priority	Mitigation Category	CRS Category
			Hurricane/Tropical Storm, Severe Weather, Tornado, Wildfire, Winter Weather									
2023-City of Orchard-004	Flood Damage Prevention Ordinance	<p>Problem: At the time of this plan update, the Flood Damage Prevention Ordinance was not available for review.</p> <p>Solution: Ensure the Flood Damage Prevention Ordinance is available online to view and meets the minimum NFIP requirements.</p>	Flood	4	1 Year	City Administration	City	The Flood Damage Prevention Ordinance will be available online for review and the City will be compliant with NFIP requirements.	<\$1,000	High	LPR	PR
2023-City of Orchard-005	Substantial Damage Management Plan	<p>Problem: The City does not have a Substantial Damage Management Plan in place, nor do they have a formal process in place when conducting substantial damage determinations. The City is in need of a formal process and plan to provide a framework for conducting such inspections and determinations.</p> <p>Solution: The City will develop a Substantial Damage Management Plan, following the six-step planning process in 2021 Developing a Substantial Damage Management Plan (https://crsresources.org/files/500/developing_subst_damge_mgmt_plan.pdf). This plan will outline responsibilities for Substantial Damage determinations, determining market value, and permit approval processes following a disaster event.</p>	Dam/Levee Failure, Drought, Extreme Temperature, Flood, Geologic Hazards, Hurricane/Tropical Storm, Severe Weather, Tornado, Wildfire, Winter Weather	2, 4	Within 5 years to develop the plan; ongoing to maintain and update the plan	Floodplain Administrator, Public Works, OEM, Construction Department	City Budget	This plan will provide a process in making Substantial Damage Determinations and allow the municipality to make these determinations and meet NFIP requirements more quickly.	< \$5,000	High	LPR	ES, PR

*Mitigation initiative is related to a critical facility and/or community lifeline

Notes: Not all acronyms and abbreviations defined below are included in the table.

Acronyms and Abbreviations:

Potential FEMA HMA Funding Sources:

Timeline:





CRS	Community Rating System	FMA	Flood Mitigation Assistance Grant Program
FEMA	Federal Emergency Management Agency	HMGP	Hazard Mitigation Grant Program
Agency		BRIC	Building Resilient Infrastructure and Communities Program
HMA	Hazard Mitigation Assistance		
N/A	Not applicable		
NFIP	National Flood Insurance Program		

The time required for completion of the project upon implementation.

Cost:

The estimated cost for implementation.

Benefits:

A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- Local Plans and Regulations (LPR)—These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Project (SIP)—These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection (NSP)—These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP)—These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.

CRS Category:

- Preventative Measures (PR)—Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- Property Protection (PP)—These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- Public Information (PI)—Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.
- Natural Resource Protection (NR)—Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- Structural Flood Control Projects (SP)—Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- Emergency Services (ES)—Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.

The prioritization criteria provided in Volume 1, Section 6 (Mitigation Strategy) identify 14 evaluation/prioritization criteria to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as High, Medium, or Low. The table below provides a summary of the prioritization of all proposed mitigation initiatives for the HMP update.





Table 9.10-19. Summary of Prioritization of Actions

Project Number	Project Name	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2023-City of Orchard-001	Expand Water Lines	1	1	1	1	0	1	0	1	1	1	0	0	1	1	10	High
2023-City of Orchard-002	Warning systems for hazard events	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2023-City of Orchard-003	Develop a Continuity of Operations Plan	1	1	1	1	1	1	1	1	1	1	1	1	1	0	13	High
2023-City of Orchard-004	Flood Damage Prevention Ordinance	0	1	1	1	1	1	1	0	1	1	0	1	0	0	9	High
2023-City of Orchard-005	Substantial Damage Management Plan	0	1	1	1	1	1	1	0	1	1	1	1	0	0	10	High

Note: Volume 1, Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).